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The Institute of British Foundrymen

The Institute of Vitreous Enamellers

The Welsh Engineers' and Founders' Association

and

The Foundry Trades' Equipment and Supplies Association

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Rolling White Cast Iron

Enthusiasm for their craft coupled with a certain naïve piety was probably responsible for the erection by Wilkinson's men at Bradley of a cast-iron pulpit. The motives which inspired certain Sheffield founders to put cast-iron razors on the market during the middle eighteenth century were less laudable; no records are extant regarding the purchasers' reaction to this novel use of a material at once so brittle yet so pregnant with tempting possibilities of quick profit. Until within comparatively recent times the term "cast iron" was frequently used in an uncomplimentary way. Legitimate spheres for its application existed, but misguided attempts to employ it in unsuitable ways were largely responsible for misconceptions commonly found among those not versed in the art of metals. The combined results of improved foundry technique, a better understanding of the raw material and a vastly increased range of irons, each capable of fulfilling perfectly some definite purpose, have all contributed to render incorrect the out-of-hand condemnation of cast iron as a low-grade material. Nevertheless, whilst a number of special alloy cast irons are now available which exhibit considerable ductility even in the cold state, it is probably still not unfair to class it in general as brittle and not amenable to working by deformation in the cold state. Similarly its capacity for hot working is commonly considered to be very limited, although it is well known that above the upper critical point certain grey irons—those containing nickel for example—may be formed by carefully-applied pressure into dies.

White irons, even more so than their grey brethren, certainly do not suggest themselves as likely subjects for experiments in hot working. Work carried out therefore at the Gunite Foundries of Rockford, Illinois, reported by Duncan P. Forbes, the President of this company, makes surprising reading. It appears from the account which is given that an order was received by the foundry for malleable cast-iron plates some 4 ft. square and about ¼ or ⅜ in. in thickness. Attempts to produce such plates by sand-casting failed; where, by good fortune and the use of a carefully controlled pouring and casting technique, some were knocked out in one piece, these were found to fracture during malleablising. A happy inspiration led to attempts being made to cast the initial white iron into billets and then to roll these (in somebody else's mill, it may be observed) into the required form. After many setbacks success was achieved and a plate obtained which was successfully heat-treated, producing a material somewhat akin to both ordinary grey iron and to malleable cast iron. It is indicated that grey iron was also successfully rolled but that its uses appear somewhat more limited than those of rolled white iron.

So the impossible has apparently been achieved—an event which occurs with disturbing frequency nowadays. Much of the conventional metallurgy taught in the schools conflicts with advances such as these. Bismuth, a typically brittle metal, may readily be extruded under special conditions as to pressure; the extruded product is brittle but for all that is none the less valuable for certain particular purposes. Rolled white iron will similarly find its own special sphere of utility either in the brittle as-rolled state or, when heat-treated, to give a range of materials brittle and hard like the parent metal or soft and ductile in the form of malleable iron.

The possibility of producing pressings, stampings or drop-forgings in white iron may seem somewhat remote, but it has been hinted that by the adoption of a special technique even this may be done if the results of preliminary experiments are not wilfully misleading.

Sporting Events

A section of the founding community will next month be testing out their "irons" in a quite different manner from that laid down in the B.S. specification. The scene of operations will be not the laboratory, but Matlock golf course. The letter we print on the next page from the Institute's Golfing Committee will interest all enthusiasts of the "royal and ancient game," and we hope that a goodly number will be able to take part in the Open Competition which has been planned for May 29. A full measure of support is essential to ensure the success of such an event, especially when it is envisaged as the forerunner of a series of annual competitions.

Golf has been described as a menace, and cricket as a ceremony. In the high season of summer we look forward to the third annual cricket match between the Institute and the Works' Management Association. Last year, it will be remembered, the works managers managed to wrest the Lichfield-Bridgeman trophy from the foundrymen, thus making the score one all (if we may be permitted to mix our sports in F.A. Cup Final week). With a golf contest a few weeks beforehand to help them get their eye in and their muscles loosened, the foundrymen's eleven should stand a better chance of turning the tables again.

Institute of British Foundrymen

BRADFORD CONFERENCE FUND

We print below a list of subscriptions to the 1938 Conference Fund of the Institute of British Foundrymen, received and promised up to and including April 21. Donations should be sent to the honorary treasurer, Mr. W. G. Thornton, The Yorkshire Repetition Castings Company, Limited, Bradford, Yorks.

	£	s.	d.
Bradford.			
Mr. Joseph Hepworth, J.P., M.P....	50	0	0
The English Electric Company, Limited	25	0	0
Crofts (Engineers), Limited ...	25	0	0
The Yorkshire Repetition Castings Company, Limited	20	0	0
Smith & Fawcett, Limited	10	0	0
David Crabtree & Son, Limited ...	5	5	0
E. & W. H. Haley, Limited... ...	5	5	0
Messrs. Harry Summersgill	5	5	0
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Messrs. Thos. S. Smeeth	5	5	0
C. Haley & Company	2	2	0
Mr. H. Forrest	2	2	0
Mr. R. D. Welford	2	2	0
Mr. S. F. Wise	2	2	0
Jessop & Boydell, Limited	1	1	0
Mr. H. A. MacColl	1	1	0
Mr. F. Squires		10	6
Mr. G. E. Booth		10	0
Mr. R. Fitzjohn		10	0
Mr. H. Blamires		5	0
Huddersfield.			
Thomas Broadbent & Sons, Limited	20	0	0
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Anonymous	2	2	0
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Shaw, Son & Greenhalgh, Limited...	1	1	0
Keighley.			
Keighley Laboratories, Limited ...	10	10	0
Clapham Bros., Limited	10	10	0
W. Slingsby & Company, Limited...	10	0	0
Samuel Fearnside & Sons	5	5	0
W. & S. Summerscales' Sons ...	5	5	0
E. A. Roper & Company	4	4	0
Shipley.			
J. Parkinson & Son	30	0	0
F. Wigglesworth & Company, Limited	10	10	0
Leeds.			
R W. Crabtree & Sons, Limited ...	20	0	0
Blakey's Boot Protectors, Limited...	10	0	0
Catton & Company, Limited ...	5	5	0
Mr. G. Neild	2	2	0
Turner Tanning Machinery Company, Limited	1	1	0
Mr. S. W Hanson	1	0	0
Halifax.			
Drakes, Limited	10	10	0
Hartley's Malleable Fittings Company, Limited	5	5	0
Mr. E. C. S. Greaves	2	2	0
Sheffield.			
Hinckleys, Limited	5	5	0
Mr. Haydn Battye	5	0	0
Manchester.			
J. W. Jackman & Company, Limited	5	5	0
Leigh & Sillavan, Limited	5	5	0
Carborundum Company, Limited ...	5	5	0
London.			
British Pigirons, Limited	5	5	0
The Morgan Crucible Company, Limited	5	5	0
Sternol, Limited	2	2	0

(Concluded in next column.)

Correspondence

[We accept no responsibility for the statements made or the opinions expressed by our correspondents.]

Institute of British Foundrymen's Open Golf Competition

To the Editor of The Foundry Trade Journal.

Sir,—At the request of several members, a Golf Competition open to associates and members of the Institute has been arranged to take place at Matlock, on Sunday, May 29. Matlock has been chosen because it is centrally situated for all Branches, and it is hoped that the competition will be supported by all golfers, whether scratch or just plain rabbit, from all parts of the country. The Matlock Golf Club have been kind enough to arrange for starting time to suit our convenience, and have quoted special inclusive terms of 6s. per head for green fee, lunch, and tea.

Major T. G. Bird, D.S.O., of Sir W. G. Armstrong Whitworth & Company (Iron-founders), Limited, has kindly signified his willingness to donate a cup, to be held by the winner for a year, for the best gross score, and Mr. J. E. Hurst, of Bradley & Foster, Limited, and a Past-President of the Institute, is presenting a tankard for the best net score, likewise to be held for a year.

It is hoped that the Competition will develop into an annual event, but it will be appreciated that its success depends largely on the support of members. Would intending competitors please write to Mr. James Bell, 3, Cherry Street, Birmingham, 2, so that arrangements can be made for starting time, lunch, etc. All golfers are invited, whether of long or short handicap. Matlock will be found a very pleasant place to leave the ladies whilst husbands are golfing, so do not let that deter you.—Yours, etc.,

James Bell, R. Stiles, A. G. Robiette } I.B.F. Golf Committee.

Catalogue Received

Cement Moulding. A full, illustrated description of the Randupson process is given in one of the smartest pieces of publicity matter which has so far emanated from a firm catering for the foundry industry. It has been issued by Hinckleys, Limited, of 11, Parade Chambers, East Parade, Sheffield. Bound in cellophane paper and assembled with spiral wire, it presents a really attractive appearance. Every aspect of the new process, both advantages and drawbacks, are set out in plain, readable English. The illustrations, which are confined to the outside covers, have been well chosen so as to show the appearance of a foundry undertaking this type of work and the sort of casting—both ferrous and non-ferrous—to which the process has been successfully applied. This publication is available to our readers on request to the issuing house.

(Concluded from previous column.)

General.	£	s.	d.
James Durrans & Sons, Limited, Penistone	10	10	0
E. Green & Son, Limited, Wakefield	5	5	0
Carrick & Foster, Limited, Bingley	5	5	0
Turner Textile Machine Company, Limited, Elland	5	0	0
Pneulec, Limited, Birmingham ...	3	3	0
Imperial Chemical Industries, Limited, Northwich	3	3	0
Mr. T. Wilson, Brighouse	2	2	0
Mr. N. W. Riley, Harrogate ...		10	6
Total	£441	3	0

Random Shots

Another football season is nearing its close, and the path of the coupon enthusiasts is strewn once again with dashed hopes. Those who have seen their sixpences thrown away without return year after year will sigh with relief, and will go straight to the seed shop, no doubt, to buy something for the garden, thereby procuring an investment with a reasonable prospect of a quick and bountiful return. The lucky fellows who have won something this season have before them a glorious four months in which to spend the money whilst awaiting with pleasurable contemplation the beginning of the next season.

* * *

There is, of course, just one sure way of winning the penny points pool, and that is the old, old method of filling in sufficient coupons to include all the possible combinations. According to one brilliant young mathematician who has worked it out, it would be necessary to fill up 14,348,907 columns. If you did one every five minutes and worked a 44 hour week, it would take 559 years, 1 week and 6 days, not counting (to quote his own words) leap years, vacations, bank holidays, coronations and days off for funerals. It would cost £59,787 2s. 3d., not counting postage or the cost of the postal order! . . . And how!

* * *

Aluminium is now being used to preserve the features of old masters from the destructive effects of damp. It is considered to be so much better than the daily bottle of port with which old masters were wont to keep out the damp, because, unlike port, aluminium does not spoil the face of the picture.

* * *

The modern tendency to Americanise the British foundry, happily, has not yet spread to the methods of its technical society. At the coming American Foundrymen's Conference in Cleveland there is to be a stag party which is advertised as going to be "stupendous, a peach, a honey, and a wow." What ardent young member wishing to attend the annual conference at Bradford would have the courage to lay such a programme before his director for approval?

* * *

Not that the British conferences are without their fun, but experience has shown that the best fun is to be got out of those spontaneous entertainments which somehow just happen, usually in the hotel lounge in the early hours of the morning; entirely unorganised; riotous certainly, but stupendous never!

* * *

As for a peach and a honey, such words here are usually kept exclusively for reference to the fair sex, whilst only last Sunday, E. V. Lucas claimed that "wow" could have only one place in the English language, that being the "wow" of Dickensian parlance, where it means nothing more or less than a vow.

* * *

A newcomer to a golf club had been guilty of unconventional behaviour on the course all day long. Unable to bear it any longer, a member went up to him and said: "Look here, old man, you can't do that sort of thing here. Don't you know who I am?"

"And who are you, pray?"

"I am the secretary of the greens."

"Good. You're just the fellow I want to meet. That cabbage I had in the club house for lunch was a disgrace."

"Marksman."

The New Factories Act—I

HOW IT AFFECTS THE FOUNDRY INDUSTRY

By F. J. TEBBUTT

Although the new Factories Act which comes in force on July 1 consolidates existing provisions, nevertheless these have been tightened up and also new provisions introduced. Apart from the actual general provisions of the Act, a feature of factory legislation has always been the power given to the Home Office to make Regulations, some of which generally apply, while others are particular to certain specified trades. At the outset, therefore, it might be useful to note that although the Act comes into force on July 1, it does not follow that the existing Regulations will cease to have effect, as power has been taken for these to be continued until such time as new ones and new drafting may be required.

In this series of articles it is proposed to cover all matters of interest to the foundry industry, and where the provisions are extended or varied by Regulations to include the obligations laid down by the Regulations and Rules as well as by the provisions, so that a complete explanation of the various matters of trade interest is given. The Act and Regulations, of course, deal with matters like health, safety, accidents, hours of employment for women and young persons, night work, fitness for employment, and dangerous and unhealthy trades and occupations.

Cleanliness and Health

The Act provides that every factory shall be kept in a cleanly state. It must be free from effluvia arising from any drain, sanitary convenience or nuisance; it must not be overcrowded, and it must be ventilated in such a manner as to render harmless as far as practicable all fumes, dust and other impurities that may be injurious to health, generated in the course of any process or work in the factory. The floor must be washed (every workroom) once or more every week, although sweeping or other method is sufficient if the room is effectively cleaned by the method used; dirt and refuse must be removed daily from the floors and benches of workrooms, staircases and passages. All inside walls and partitions, ceilings and tops of rooms and walls, sides and tops of passages and staircases must be whitewashed or colourwashed at least once every fourteen months. If these items are painted with oil paint or varnished, washing every fourteen months with hot water and soap or other detergent or cleaning by any other approved method is sufficient to meet this requirement, provided that repainting or revarnishing takes place once in every seven years. If the surface is smooth and impervious, washing with hot water and soap or other detergent or other approved cleaning method is sufficient once every fourteen months. This limewashing or washing, etc., provision will not apply ordinarily to premises where mechanical power is not used and employees number less than ten.

Moreover, Regulations provide for exceptions to this requirement also, as regards factories and particular trades which afford a clear 500 cub. ft. for each person. Blast furnaces, iron and copper mills come under this rule of exception, and there is a general exception as regards certain parts of factories, such as storage rooms, parts in which dense steam is continuously evolved, parts where there are no glazed windows in walls or roof, tops of rooms at least 20 ft. from the floor, and tops of rooms in works where agricultural-implement making takes place. If each employee is afforded a clear 2,500 cub. ft., shipbuilding works, gun factories, engineering works and foundries (except brass foundries) are also excepted from this requirement. These exceptions, however, do not apply to mess rooms, engine houses, fitting shops or sanitary conveniences, except as regards walls or tops made of glazed bricks, tiles, glass, slate, marble, or galvanised iron, and washed with water and soap once at least every fourteen months.

Structural Obligations; Overcrowding; Ventilation; Temperature

The Act really lays down the number of persons to be employed in any workroom, as the amount of cubic space allowed for every person employed in any workroom must not be less than 400 cub. ft., this minimum having been changed from 250 cub. ft. No space above 14 ft. from the floor is to be taken into account for this cubic space obligation, however.

For any workroom used on July 30, 1937, the old requirement of 250 cub. ft. will continue to apply until July 30, 1942, and if before that date effective mechanical ventilation has been provided 250 cub. ft. will rule until July 30, 1947, that is if the business remains under the same occupier (or his successor).

Adequate measures must be taken for securing and maintaining a reasonable temperature in each room, and sufficient means of ventilation must be provided and maintained.

Practicable measures must be taken to prevent the workpeople inhaling any dust, fume, gas or vapour which is likely to be injurious or offensive to the workpeople concerned; this applies in all cases where there is any substantial quantity of dust of any kind. Particularly (if the process makes it at all practicable), exhaust appliances must be provided and maintained as near as possible to the origin of the dust, etc., so as to prevent it entering the air of any workroom.

Where a stationary internal-combustion engine is used, it must be partitioned off from any workroom, and provision must be made for conducting the exhaust gases into the open air.

Lighting; Sanitary Conveniences and Medical Supervision

A new provision altogether makes obligatory that sufficient and suitable lighting must be provided where persons are working or passing; all glazed windows and skylights in workrooms must be kept clean inside and outside, and free from obstruction. Whitewashing or shading of windows, etc., to mitigate heat or glare is permissible.

Suitable and sufficient sanitary conveniences must be provided for the workpeople—properly lighted—and there must be separate accommodation for persons of each sex; the latter obligation does not apply where all employees are of the same family.

Regulations lay down rules for these as follow. There must be one convenience for every 25 females and one convenience for every 25 males. But where the number of males employed exceeds 100, and there is sufficient urinal accommodation, the proportion is one convenience for every 25 for the first 100, and for every 40 after the first 100. If the number of males employed exceeds 500 and sufficient urinal accommodation is provided, the proportion all through may be one convenience for every 60 males, but for this rule to be operative the inspector must certify in writing that proper supervision and control in regard to the use of the conveniences is exercised by officers specially appointed for the purpose. Such a certificate is required to be attached to the General Register. There are other conditions laid down in the Regulations concerning these conveniences, such as being kept in a cleanly state, being under cover, being private, with approaches separate for each sex; space forbids details, and most firms automatically conform to these nowadays.

A new provision gives power to the Home Secretary to make Regulations requiring medical supervision of workpeople employed in certain processes. This is to apply where cases of illness have occurred which may be due to the process or other conditions of work or where there is risk of injury to the health of workers by changes in the processes, or use of new substances, or where young persons are about to be employed on work which may cause risk of injury to their health.

Welfare

Some of the welfare provisions of the new Act were formerly only applicable to certain trades by Regulations; now these particular obligations are of general application as follows. An adequate supply of drinking water must be available for the employees, and this applies to all factories irrespective of the size of the concern.

Washing facilities (which term includes the provision of soap and towels or other means of cleaning and drying) are to be provided, but the application of this obligation does not come into force generally until July 1, 1939. But for workpeople employed in processes in which lead, arsenic or any other poisonous substance is used (the provision is already obligatory here under existing law) the obligation will apply from July 1, 1938. This rule will also apply to any process prescribed by the Home Secretary as liable to cause dermatitis or other skin affection. Power, however, is given the Home Secretary to exempt by Regulations certain factories from this obligation where it would seem unreasonable to apply it on account of special circumstances (*e.g.*, restricted accommodation and other washing facilities conveniently available); on the other hand, power is taken to lay down by Regulations what is considered as adequate washing facilities for the purposes of this provision.

Similarly power to exempt or to lay down standards is taken in respect of the obligation to provide proper accommodation for clothing not worn while working (*e.g.*, cloak room) and arrangements must be made for drying such clothing if required. Where the work of female workers is done standing, suitable sitting facilities must be provided, if an opportunity for rest may occur in the course of their employment.

First-Aid Boxes

Apart from the special Regulations as regards particular trades, there is a general obligation for the provision of a first-aid box or cupboard, and this applies to all factories irrespective of whether mechanical power is used or not and irrespective of the number of employees. If there are more than 150 employees, one additional box or cupboard for every 150 employees must be provided (any fraction of 150 being counted as 150). The required contents are laid down by Regulations, and nothing but appliances and requisites for first aid must be kept in the box or cupboard. Where there are more than 50 employees a person must be detailed to have charge of the box or cupboard, and must be one trained in first-aid treatment, and be one readily available during working hours. If an ambulance room is provided, the Chief Inspector may by certificate and subject to conditions exempt the factory from the foregoing first-aid requirements.

As regards foundries, blast furnaces and the like, Regulations make the provision of an ambulance room obligatory, that is, if the employees number 500 or more. This Regulation provides that the room shall be a separate room and only used for treatment and rest, it must be well lighted, and with a floor space of 100 sq. ft. or more, with hard and impervious walls and floor. The room must contain at least a glazed sink with hot and cold water always available, a table with smooth top, means for sterilising instruments, a supply of suitable dressings, bandages and splints, a couch and a

(*Concluded on page* 345.)

Institute of British Foundrymen

BRADFORD CONFERENCE PROGRAMME

As previously announced, the thirty-fifth Annual Conference of the Institute of British Foundrymen will be held at Bradford, from June 14 to 17, 1938, and will be arranged by the West Riding of Yorkshire Branch. This is the first occasion on which the Conference of the Institute has been held in the area covered by this Branch, and the members of the Branch are delighted to have the opportunity of entertaining their fellow members of the Institute and their ladies. Papers covering many aspects of foundry practice will be presented and discussed, and these together with the works visits will be of real value to all foundrymen.

The West Riding of Yorkshire is the most important woollen manufacturing area in the world, but the manufacture of woollen goods is not by any means the only industry which is carried on in this district; it is also a well-known engineering centre. As would be expected, textile machinery forms an important section of its engineering manufactures, but it is equally well known for its machine tools, electrical plant, and a large variety of other engineering specialities. The Conference Committee has received invitations to visit a number of industrial establishments in the West Riding area, and whatever may be the foundryman's particular speciality, he will find something in these visits which will be of value to him.

Bradford, which is the centre of the Conference, is a progressive city. Its Technical College, where the meetings will be held, is one of the largest in the country. Its parks are famous, and members and ladies will have an opportunity of inspecting the Art Gallery, the Cartwright Memorial Hall in Lister Park, at the reception to be given by the Lord Mayor and Corporation.

The industrial towns of the West Riding of Yorkshire are surprisingly near to the open moors, and Bradford is no exception. In a few minutes one may be away from industrialism and among the Pennine Hills. A little further afield lie the beautiful Yorkshire Dales, and a district which is rich in ancient castles, cathedrals and the ruins of famous abbeys. Harrogate is also near at hand. The excursion on the closing day of the Conference is planned to take in much of this delightful country. A special programme for ladies has been arranged, and there will be other social activities for both members and ladies.

Members who intend to participate can assist the organisers considerably by:—(*a*) Returning their completed reply form as early as possible, and in no case later than Saturday, May 21 (late applications add considerably to the work of the Committee; every effort will be made to deal with late applications, but as numbers are limited at many functions and visits, no guarantee can be given that late applicants will receive the tickets for which they apply); (*b*) attending at all fixtures five minutes before the scheduled time. In order to carry out the programme satisfactorily, punctuality is essential, and members arriving at the starting place of buses, etc., after the times given in the programme may be left behind.

PROGRAMME

Tuesday, June 14.

5.30 p.m.—Annual General Meeting at the Bradford Technical College, Great Horton Road (open to all Members, Associate Members, and Associates).

8.0 p.m. to 12 midnight.—Civic Reception at the Cartwright Memorial Hall, Municipal Art Gallery, Lister Park, Manningham Lane, Bradford, by kind invitation of the Lord Mayor and Lady Mayoress of Bradford (Alderman and Mrs. Henry Hudson). (Buffet; dancing.) (All members and ladies.) (Evening dress.)

By courtesy of the West Riding of Yorkshire Branch, motor coaches will be available to convey guests to their hotels at midnight.

Wednesday, June 15.

9.15 a.m.—Conference opens at the Bradford Technical College, Great Horton Road (all members and ladies).

Welcome by the Lord Mayor of Bradford (Alderman Henry Hudson, J.P.).

Presentation of the Oliver Stubbs Medal.

Presentation of the E. J. Fox Medal.

Induction of the new President and Vice-Presidents.

10.0 a.m.—Presidential Address by Mr. Joseph Hepworth, J.P., M.P.

10.30 a.m.—Presentation and discussion of Papers Nos. 631, 632 and 633 (Session A); 634, 635 and 636 (Session B.).

12.30 p.m.—Conference adjourns. By courtesy of the West Riding of Yorkshire Branch, coaches will be available to convey members to the Connaught Rooms for luncheon.

1.0 p.m.—Luncheon at the Connaught Rooms, Manningham Lane.

2.0 p.m.—Motor coaches leave the Connaught Rooms for the following works visits:—

(1) William Asquith, Limited, and Modern Foundries, Limited, Halifax (machine-tool makers).

(2) Fairbairn Lawson Combe Barbour, Limited, Leeds (textile-machinery manufacturers).

(3) John Fowler & Company (Leeds), Limited, Leeds (diesel engine and tractor manufacturers).

(4) Prince-Smith & Stells, Limited, Keighley (textile-machinery manufacturers).

Note.—Members may join only one of the above visits, 1, 2, 3 or 4, as each visit will occupy the whole afternoon. On return, motor coaches will arrive at the Great Northern and the Midland Hotels, Bradford, about 5.30 p.m.

7.0 p.m.—Reception by the President and Mrs. Hepworth prior to Annual Banquet.

7.30 p.m. to 1.0 a.m.—Annual Banquet at the Connaught Rooms, Manningham Lane, followed by dancing until 1.0 a.m. (Evening dress).

By courtesy of the West Riding of Yorkshire Branch, motor coaches will be available to convey guests to their hotels from midnight until 1.0 a.m.

Thursday, June 16.

9.30 a.m.—Conference resumes at the Bradford Technical College, Great Horton Road. Presentation and discussion of Papers Nos. 637, 638, 639 and 640.

12.30 p.m.—Conference adjourns. By courtesy of the West Riding of Yorkshire Branch, motor coaches will be available to convey members to the Connaught Rooms for luncheon.

1.0 p.m.—Luncheon at the Connaught Rooms, Manningham Lane, at the invitation of the West Riding of Yorkshire Branch.

2.0 p.m.—Motor coaches leave the Connaught Rooms for the following works visits:—

(7) Hepworth & Grandage, Limited, Bradford (piston and piston-ring manufacturers).

(8) J. Blakeborough & Sons, Limited Brighouse (valve specialists).

(9) Thos. Broadbent & Sons, Limited, Huddersfield (chemical equipment manufacturers).

(10) Hopkinsons, Limited, Huddersfield (steel founders and valve manufacturers).

Note.—As each visit occupies the whole afternoon, members may join only one party, 7, 8, 9 or 10. Motor coaches will return to the Great Northern and the Midland Hotels, Bradford, arriving about 6.0 p.m.

8.0 p.m. to 11.30 p.m.—Conversazione at the Bradford Technical College, by kind invitation of the Chairman (Alderman J. W. Longley, J.P.) and members of the Technical Education Sub-Committee of the City of Bradford. (All members and ladies.) (Evening dress.)

By courtesy of the West Riding of Yorkshire Branch, motor coaches will be available to convey guests to their hotels at 11.30 p.m.

Friday, June 17.

Motor coach excursion through the beautiful Yorkshire Dales (all members and ladies). Luncheon. Tea at the kind invitation of the President (Mr. Joseph Hepworth, J.P., M.P.), and Mrs. Hepworth.

9.30 a.m.—Leave Bradford (Alhambra Theatre, Morley Street).

10.0 a.m.—Leave Leeds (City Square).

8.0 p.m.—Arrive at Bradford.

Ladies' Programme

Tuesday, June 14.

8.0 p.m.—Civic Reception at the Cartwright Memorial Hall, Lister Park, Manningham Lane, Bradford, by kind invitation of the Lord Mayor and Lady Mayoress of Bradford (see general programme).

Wednesday, June 15.

9.15 a.m.—Ladies are invited to attend the opening of the Conference at the Bradford Technical College, Great Horton Road (see general programme).

10.15 a.m.—Motor coaches leave Bradford Technical College for a tour of Bradford Parks, comprising Peel, Bradford Moor, Bowling, Horton, and Lister Parks, by kind invitation of the Chairman (Alderman S. Horsfall) and members of the Parks Committee of the City of Bradford. On return, coaches will arrive at the Connaught Rooms at 12.45 p.m. for luncheon.

1.0 p.m.—Luncheon at the Connaught Rooms, Manningham Lane.

2.0 p.m.—Motor coaches leave Connaught Rooms for visits to the works of:—

(5) John Foster & Son, Limited, Black Dyke Mills, Queensbury (spinners and manufacturers).

(6) Price's Tailors, Limited, Leeds (proprietors of the Fifty Shilling Tailors).

On return, coaches will arrive at the Great Northern and the Midland Hotels, Bradford, about 5.30 p.m.

7.0 p.m.—Reception and Annual Banquet at the Connaught Rooms (see general programme).

Thursday, June 16.

Morning free.

1.0 p.m.—Luncheon (see general programme).

2.0 p.m.—Motor coaches leave for visits to the works of:—

(11) John Mackintosh & Sons, Limited, Halifax (manufacturers of Mackintosh's toffee-de-luxe).

(12 Patons & Baldwins, Limited, Halifax (manufacturers of knitting wools).

On return, motor coaches will arrive at the Great Northern and the Midland Hotels, at about 6.0 p.m.

8.0 p.m.—Conversazione at the Bradford Technical College (see general programme).

Friday, June 17.

Motor coach excursion (see general programme).

Programme of Papers

Wednesday, June 15.

Session A.

No. 631.—"The Randupson Process of Cement Moulding," by F. W. Rowe, B.Sc. (Associate Member) (David Brown & Sons (Huddersfield), Limited).

No. 632.—"Relief of Internal Stress in Castings," by L. E. Benson, M.Sc., and H. Allison, B.Sc. (Metropolitan-Vickers Electrical Company, Limited).

No. 633.—"English and American Steel Foundry Practice," by C. J. Dadswell, Ph.D., B.Sc. (Eng.), Ingenieur E.S.F. (Member) (English Steel Corporation, Limited).

Session B.—Symposium of Papers on Non-Ferrous Subjects.

No. 634.—"The Heat-Treatment of Aluminium-Silicon Alloys," by M. Gauthier (Laboratoire des Recherches de la Cie Alais, Froges and Camargue). (Presented on behalf of the Association Technique de Fonderie, France.)

No. 635.—"Aluminium Casting Alloys," by Dipl. Ing. G. Gürtler (Metallgesellschaft A.G., Frankfort-on-Main). (Presented on behalf of the Technischer Hauptausschuss für Giessereiwesen, Düsseldorf.)

No. 636.—"Some Physical Factors in Casting High-Strength Brasses," by J. E. Newson, M.Met. (The Manganese Bronze & Brass Company, Limited).

Thursday, June 16.

No. 637.—"Chemical Changes of Cast Iron in Cupola Melting," by Dr. J. T. Mackenzie (American Cast Iron Pipe Company, Birmingham, Ala., U.S.A.). (Presented on behalf of the American Foundrymen's Association.)

No. 638.—"Copper in Cast Iron," by A. J. Nicol Smith, B.Sc. (Associate Member). (Arranged by the British Cast Iron Research Association.)

No. 639.—"Modern Manufacture of Machine Tool Castings," by J. Blakiston, A.I.Mech.E. (Associate Member) (Modern Foundries, Limited).

No. 640.—"Sand-Blasting as applied to the Vitreous Enamelling Process," by H. Whitaker, M.Sc. (Rustless Iron Company, Limited, Keighley). (Arranged by the Institute of Vitreous Enamellers.)

Hotel Accommodation

There is always considerable demand upon hotel accommodation during the week in important industrial centres, and it is essential that hotel accommodation should be reserved in advance. Particulars of the hotels in Bradford and the surrounding district are obtainable from the Secretary of the Institute, St. John Street Chambers, Deansgate, Manchester.

General Notes

Registration.—Members and ladies attending the Conference will receive by post prior to reaching Bradford a Registration Card bearing Member's Registration Number. This card should be exchanged upon arrival at the Conference Office for a booklet of tickets for the functions and visits indicated by the Member on his reply form. Members who desire to have their tickets, Papers, etc., forwarded to them in advance of the Conference may obtain them by enclosing an additional 4d. per head, when sending their remittance to the Secretary of the Institute. In these cases, no registration cards will be sent. In each case the contents should be checked immediately.

Conference Office and Information Bureau.—The office at Technical College, Great Horton Road, Bradford, will be open for the issue of tickets, booklets, copies of Papers, etc., as follows:—Tuesday, June 14, 2 p.m. to 6 p.m.; Wednesday, June 15, 9 a.m. to 12 noon; Thursday, June 16, 9 a.m. to 12 noon.

Souvenir Booklet.—A souvenir booklet giving full details of the programme, notes on the district, works to be visited, etc., will be supplied to each member and lady attending the Conference.

Badges.—In view of the issue of membership badges to all members of the Institute, it has been decided not to issue a separate conference badge. A special badge will be presented to the ladies. The Institute's badge is engraved with the member's name and year of election. Any member who is not already in possession of a badge may obtain one at a charge of 2s., by applying to the Secretary of the Institute before May 21. As the name has to be engraved on each badge, delivery in time for the Conference cannot be guaranteed for badges ordered after May 21.

Correspondence.—Members may have their correspondence forwarded to them during the Conference period addressed: c/o The Institute of British Foundrymen, Technical College, Great Horton Road, Bradford. Letters so addressed will be available at the Conference Office, Technical College, Great Horton Road, Bradford.

Training the Foundry Apprentice*

By R. F. Coates.

The foundry industry is now giving much attention to the training of apprentices, due no doubt to the fact that there is a general desire to induce the better-educated lad to adopt the foundry as a career. It is true that mechanisation has done much to reduce the need for apprentices in the light foundries; but there still remain excellent opportunities for ambitious lads in other branches of this important engineering trade.

In many cases lads who have started foundry work leave for other occupations more congenial to them. The industry cannot afford to lose a large percentage of entrants, and this Paper aims to outline practical methods to keep the apprentices interested in their jobs and further to encourage the lads now serving their apprenticeship.

The general appearance of the average foundry is far from attractive, especially to the lad fresh from school, and very often, where he has a choice of a trade, the foundry is rejected on the grounds that it is dirty, dull, and a place for hard work. In reality, however, the foundry can be likened to an old text-book—the outward appearance is unattractive, but within its covers there is a wealth of knowledge to be gained by the enthusiastic students.

Scientific research during recent years has opened a door to technical studies which was closed to the foundrymen of the last generation. Some foundries have a small shop for their apprentices with a suitable man in charge. This method has much to recommend it; but from the author's experience it is not conducive to concentration upon the work. The lad is much more likely to give more attention and to become more interested if he is put to work with a good moulder who can instruct him in an interesting manner in the various moulding operations.

Early Beginnings

Some consider that a start should be made at the core-bench, but as the moulding is more constructive it has a greater appeal to the youthful mind, and therefore at the beginning secures interest. After a few weeks the lad should be allowed to make a suitable casting entirely upon his own. This will be a guide as to his abilities and an encouragement to him. A few months at moulding may be followed by a course of core-making, again under the supervision of a good craftsman.

When it is considered that sufficient progress has been made, the foreman can select a suitable job to give the apprentice and instruct him to make both cores and mould. This will be a good lesson for him to act entirely upon his own initiative, and a further guide as to his progress. Should he be successful in producing a sound casting, it will give encouragement; if he should fail, the foreman can inspect the casting with him, pointing out the defects, and how they are avoided.

Much can be learned from a close investigation of a defective casting; the lad therefore should be taught to find out why a casting is scrapped, and if he cannot supply the answer, someone who can should be asked. To the younger workers there are occasions when the foundry is most disheartening; it is then that a little helpful advice from one in charge does much to keep the lads interested, who at such a time may feel like leaving the foundry.

Technical Studies

Technical studies should begin as soon as the apprentice is making good progress in his practical work. It is considered a wise plan to confine these studies as far as possible within the hours of his daily work. For example, if he is employed in a foundry producing heavy castings, then the studies should consist of the technique as related to that branch of the industry. This may not seem practicable if a student is attending evening classes where a general foundry syllabus is being studied, but it is here that the student can supplement the class studies with those at home relating more to his own daily work.

Suggested Course of Study

This is an age for specialisation, and there is a greater chance of success by concentrating upon the particular class of work to which one is apprenticed, rather than by attempting an elaborate course of studies which cover the many branches of foundrywork. For the average apprentice the following course of technical studies is suggested: (1) Moulding and core sands; (2) moulding, green and dry sand; (3) venting moulds and cores; (4) runners, risers, and feeding; (5) the use of chills and denseners; (6) shrinkage and contraction; (7) pressures exerted by metal in moulds; (8) cupola practice; (9) mixing by analysis; (10) metallurgy, and (11) foundry management.

Much could be added, but the above is sufficient for the study of apprentices who, if enthusiastic, will considerably add to their acquired knowledge by linking the technical and practical work as their experience increases, which often supplies the answer to many a foundry problem which cannot be found in the text-book.

* This Paper was awarded the first prize in a Short Paper Competition organised by the East Anglian Section of the Institute of British Foundrymen.

The New Factories Act—I

(*Concluded from page* 343.)

stretcher. Where employees are of both sexes, arrangements must be made for separate treatment at the ambulance room. A qualified nurse or other person trained in first aid, readily available during working hours, must be in charge, and a record must be kept of all cases of sickness and accident treatment. An ambulance carriage must be provided, where this rule applies, unless a carriage is readily available if required from a hospital or other place available on the telephone.

Where the manufacture of hollow-ware or the process of galvanising is carried on, Regulations require the provision of suitable protective clothing for all persons employed in wet processes, including for persons coming in contact with acid or acid solutions finger stalls or (where necessary) gloves of rubber or other suitable material, aprons of acid-proof material and clogs.

A mess room for all persons distinct from the cloak room must be provided, and the rule also makes obligatory the provision of a cloak room or other accomodation for clothing put off during working hours for women and girls (incidentally, the general cloak-room provision will make this provision obligatory for all employees—see above).

Notwithstanding the various provisions in the Act, the Home Secretary is still given power to make Welfare Regulations which may apply to a particular trade or factory or to any class or description of trades or factories.

Use of Plywood for Patternmaking*

By Lieut.-Col. W. J. GROSE

It would be difficult to find a material more useful for patternmaking purposes than plywood, yet how seldom it is used in the patternshop. Unfortunately, there are still many sound practical patternmakers and moulders who are prejudiced against the use of plywood.

The objections raised are usually:—(*a*) Patterns are not strong enough for heavy ramming; (*b*) invariably the patterns draw badly, and (*c*) moisture affects the skin or surface of the pattern. These difficulties may be overcome in most cases by the patternmaker with practical experience and a will to improve the general construction of his patterns.

With this end in view, it is intended in this Paper to explain a few of the principal methods which can be applied to patternmaking, using plywood. The Paper does not cover the whole field of operations, but is a guide to those who have not made a study of it. Plywood is not suggested for use on all patterns, but only where an improvement in time and labour can be accomplished. Only trial and practical experience can show the great advantages of plywood compared to other materials, which is why a more sympathetic use of plywood is suggested for the future.

The chief factors to be considered when designing and constructing plywood patterns are the following:—(1) The pattern must be entirely satisfactory from the foundry point of view; (2) the saving of time on previous similar patterns made, and (3) saving in cost of material used compared to other materials.

Types of Patterns

The following types of patterns which have been made from plywood will give some idea of the extent to which it can be used:—

Jigs for setting multiple, irregular-shaped patterns on boards, for moulding machine; templates, small bend pipes, tees, etc., made with ¼-in. plywood plate to prevent warping, the bodies shaped with solid wood; centre plates or arms for spur wheels and pulleys up to 3 or 4 ft. in diameter; a tapered column 18 to 24 in. in diameter, 24 ft. long; bushes, all sizes from 6 in. to 5 ft. in diameter; straight or tapered bushes, collapsible, with corebox to suit; conical liner segments; cones; cylinder bodies, with circular waterjacket corebox made in sections; curved caps for gear boxes, large and small, with coreboxes to suit, and valves and coreboxes.

A Tapered Bush Pattern

The following is the method of construction of a tapered bush pattern having a large diameter of 48 in., a small diameter of 36 in. by 24 in. long, the method being similar for either large or small straight or tapered bushes. First, the rectangular tapered body is constructed, since it is easily made rigid, thus guaranteeing that the top and bottom rings are concentric. This box or body may be built up of ⅜-in. shelving, which is cheap, and with suitable 1¼-in. batons placed inside at the corners and centres. The size of the body across the corners is made to the inside of the ply shell, allowing flats wide enough to take two rows of nails for the butt jointing of the plywood later on.

The length of the body is less than the thickness of the two rings which are screwed to the top and bottom of the body. These rings may be built of two thicknesses of ⅜-in. segments, 4 or 5 in. wide, screwed and glued. As the distance between these rings is too great, it is necessary to place bridges 4 or 5 in. apart to reinforce the plywood shell. The plywood can then be cut to suit two or four sections of the cone. To mark the sheets of plywood, all that is necessary is to roll the skeleton pattern over the sheet and mark in with a pencil, allowing ⅛ in. top and bottom for finishing off after nailing.

It is very important to nail radially, beginning at the left edge and from the centre working equally to the top and bottom. This overcomes any tendency to warp the plywood. If extra layers are required, repeat with overlapping joints. Wetting the faces of the plywood with hot water before glueing is essential, the glue being applied just ahead of the nailing to prevent chilling. Assuming a grinder has been used, the approximate time taken to make this pattern is about 16 hrs., while the material cost is about £2 6s.* An old-style lagged pattern would have taken about 48 hrs., the material costing about £5. Thus there is a saving of 32 hrs. and £2 14s. in material.

One Half of a Cone Pulley

This is a somewhat different type from the previous pattern. It is 23½ in. diameter to 4 in. diameter, 4⅝ in. deep, ⅝ in. metal with 1½ in. metal at the top.

Body Form.—The plate can be made of ⅜ in. shelving. On this are screwed radially twelve ribs, forming the inside skeleton cone.

Marking.—The plywood is cut in one circular piece, less the gap, to form the cone.

Glueing and Nailing.—Place the 3 mm. plywood on to the form, taking particular care that the butt-joint is radial, then nailing to the ribs and baseplate in a similar manner as was described for the tapered bush. The layers of plywood are nailed and glued overlapping the joints, continuing until the required thickness is obtained. When dry, trim the large diameter to size with the band saw, and finish off the edge with the grinder. To remove the inside form, unscrew the baseplate from the ribs, then pull each rib separately off the nails. The nails are removed from the cone by cutting them off flush with the face, with the hacksaw, finishing by filing.

Varnishing and Waxing.—To prevent the edge of the cone from opening out through moisture in the sand, lead rivets made from 3/13 in. round lead wire are used. These rivets are spaced with a pitch of 3 in., ½ in. from the edge. The small end is now filled in with a piece of clear pine, nailed or screwed, filling in the corners with leather fillets. Wax is well rubbed into the edge with a heated tool and then the whole well varnished or "ducoed." Every precaution should be taken to prevent moisture opening the layers of plywood, for once this happens, very little can be done to repair the damage.

This yields a pattern that is accurate, serviceable, easily made and inexpensive, and should stand up to several hundreds of moulds being made from it. The time it required was 9¾ hrs., and the cost of the timber 10s. 6d. Allowing for part of the timber of the form to be used again for other purposes, the cost of the pattern would be 7s.

Making a Cone Flange with 3 mm. Plywood

A start is made by drawing a section of the steel plate cone and showing the position of the flange on the side.

Sizes.—The diameter of the flange is 24 in. by 1½ in. thick. From this, project the plan and show the plywood at least 2 in. wider than the flange on each of the four joints. This extra width is the allowance for nailing the ply to the form, also to give sufficient room to cut out the flange, missing the nails. Now draw the end elevation showing the three curves, the radius of each being taken from the section. Marking off the width, the depth of the form, allowing sufficient wood for the nails at each side, can then be decided. It is now necessary to mark in the baseplate with the required number of bridges, which are spaced about 5 in. apart. The depth of this form reduces the amount of timber to a minimum as compared to the form if made from the centre-line.

Form.—One first makes a baseplate of ⅞ in. shelving about 28 in. square. Across this will be screwed the bridges, forming a complete section of the cone. Along the ends of the bridges are fastened two strips; these are for the purpose of nailing the two edges of the ply.

Flange.—The method of glueing is lightly to wet both faces of the ply with hot water before applying the glue. The glueing and nailing must be done as rapidly as possible, as the glue sets very quickly. Continue until the required thickness of 1½ in. is reached. The time taken for the glue to set is regulated by atmospheric conditions, so allow sufficient time to set before cutting.

Finishing.—After this it is only necessary to mark off the flange with a ply template, cutting out the flange with the band saw and finishing the edge with the grinder. Then remove the form, rivet, and varnish.

It has been found that a ply pattern is far superior to the clear pine pattern in that it does not shrink or warp, and remains true to form, being easier to construct and taking less time to make. The following is the approximate difference in time and timber:—Plywood pattern: Time, 8 hrs.; timber, 16s. Clear pine pattern: Time, 24 hrs.; timber, 30s. Thus there is a saving of 16 hrs. and 14s. timber.

Kiln Feeder Bucket

Sizes.—The bucket is 9 in. long, 7 in. wide and 7 in. deep. Here again plywood forms an ideal foundation. The ends are ½ in. thick, the sides ⅜ in. thick, the bottom round, having a 2 in. radius. The top is cut away at an angle.

Body.—The pattern is required to leave its own core. If this pattern were made of clear pine, most likely it would not stand up to heavy usage. By making it of plywood, the pattern is strong, rigid and serviceable, standing up to several hundreds of moulds.

Form.—As with the previous examples, the form, made to the inside dimensions, but with the extra length and depth for nailing, will be started with the baseplate, screwing three bridges—one in the centre ⅞ in. thick, one each end 1¼ in. thick. This allows sufficient space to saw-cut between the nails, and leaves a thickness of ½ in. on the ends of the pattern. The ends can then be ground by the grinder, allowing the necessary taper. The taper for the inside was allowed for before the end bridges were secured to the baseplate.

Cutting.—For cutting the top at an angle, place the pattern on its flat side, cut with the band saw and finish with the grinder.

Glueing and Nailing.—The fastening of the 3 mm. plywood to the form should be carried out as follows: Start by nailing along the baseplate, then up evenly at both edges on the one side, gradually bending and nailing, finishing on the other side at the baseplate. The first layer of plywood should be glued to the ends, but not to the centre bridge. All that is now necessary is to nail or screw the three layers of plywood to the ½ in. thick ends before cutting, and to allow sufficient time to elapse for the glue to set.

Finish.—Rivet, wax and varnish.

For the construction of this pattern the time was 7¼ hrs., and the material cost 3s. 3d.

Plywood Jig for Setting Patterns on Moulding-Machine Boards

Frame Sizes.—The boards for setting the patterns are made to suit rectangular-shaped alumi-

* Paper delivered before the South African Branch of the Institute of British Foundrymen, Mr. T. Nimmo Dewar presiding. Reprinted from "The Engineer and Foundryman" (South Africa).

* South African costs are not necessarily the same as those obtaining in the U.K.—Editor.

nium frames. For this particular frame the outside dimensions are 16 in. by 19½ in., accurately machined all over. They are used in most cases in pairs, for cope and drag boxes. At each end are placed pins to suit the moulding boxes, one ⅝ in. diameter and the other ¾ in. diameter.

Jig Marking and Cutting.—For the jig the most convenient thickness is 3 or 4 mm. plywood. This is cut accurately to the outside dimensions of the frame. Place the eight half-grenade patterns in two rows of four, with sufficient length of print between for supporting the double core, mark carefully and cut out the shape of the pattern with the jig saw machine. Four edges are cut for setting the prints. The jig is now nailed temporarily to the board, setting the edges carefully to the outside edges of the frame.

Pattern Setting.—The patterns are now set in the jig and fastened to the board. Removing the jig, turn over and fasten to the second board and set pattern. This method of setting has been found very accurate and the jig is simple to make. As the shape of the grenade pattern is irregular, to set it by measurement is very difficult and inaccurate. The principle of this jig can be applied to numerous other patterns, such as bend pipes placed diagonally on the boards, etc.

Cylinder Liner

Fig. 1 shows a gas engine cylinder liner pattern, 7 ft. long, barrel 24 in. diameter, and a valve chamber of 36 in. diameter. The job was cast vertically.

Body.—It is an excellent example in which plywood can be used to advantage. In the centre is seen one outside half of the pattern covered entirely with 4 mm. plywood. On the right is shown the other half of the pattern at the joint, with the plate and built-up bridges which support the plywood. On the left hand is the corebox. This is of simple construction, having boxed-up sides and ends, with crossed ribs covered with plywood. In nailing on the plywood of this pattern, extreme care must be taken, for otherwise a twist of ⅜ in. to ⅝ in. may occur.

Frame Inside Ends.—By having a solid pattern and corebox, it can readily be appreciated that a considerable saving of time in the foundry results. Not only in time does one score, but a better quality casting is assured by having a first-class mould and core. The finish of the mould and core from a first-class pattern and corebox, and its effect on the quality of the casting, and also its stresses, are not always appreciated as they should be. The extra cost of the work on the pattern is more than compensated by the saving in time by the foundry.

Cylinder Water-Jacket Corebox

Sizes (Outer).—In Fig. 2 is shown a cylinder water-jacket corebox. The sizes are roughly 26 in. diameter, 1¾ in. thick, and 24 in. long. On the right will be seen one half of the box, with the collapsible bush to form the inside of the core. This bush is made up of four segments, each fitting against a flat of the square box or body. The segments are made with a ⅞ in. plate with bridges, the outer side covered with 3 mm. plywood. This method overcomes warping and shrinking, is quickly made, and cheaper in material compared to solid timber. The left of Fig. 2 shows the other half of the box outside. It will be seen to be constructed of four layers, 6 in. deep, the whole set, when together, having a diametrical joint. Each piece is of skeleton construction covered on the inside with plywood. The whole is a straightforward band saw and grinder job.

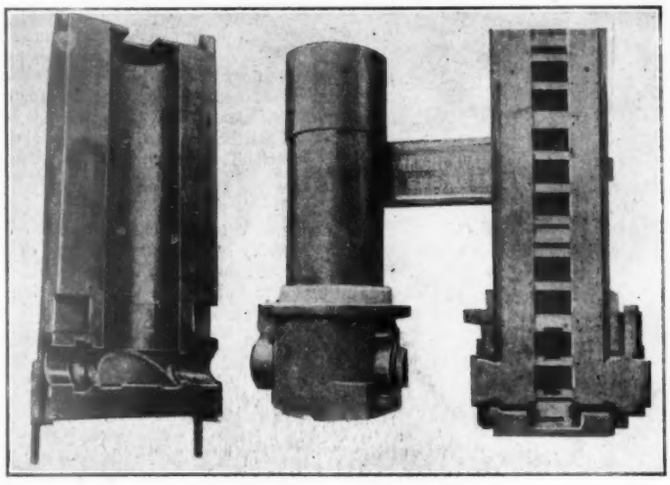

Fig. 1.—Gas-Engine Cylinder Liner Pattern.

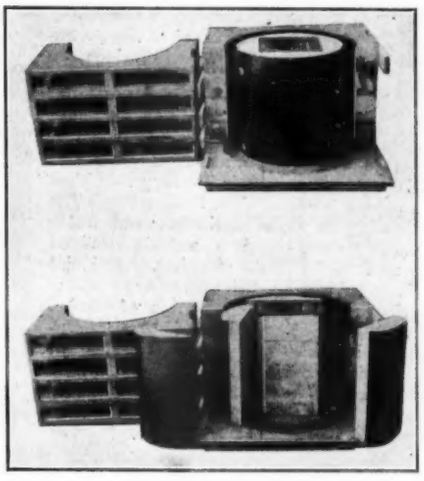

Fig. 2.—Cylinder Water-Jacket Corebox.

Gearbox

A typical example of the employment of plywood in a gearbox pattern is illustrated in Fig. 3. This represents the general construction of the pattern, which is 25¾ in. long, 22 in. high, with 6 in. from face of flange to back of body. The flange and footstep, back and walls are made entirely of plywood. The body was first started by making a form of ⅞ in. shelving to the inside dimensions, allowing for the necessary taper, the depth being ½ in. from the face of the flange to the outside of the back, a total of 5½ in. This is done so as to utilise the piece cut from the inside of the flange to be used as the back, which is ½ in. thick.

Fig. 3.—Pattern for a Gearbox.

Extra segments 1¼ in. thick are then screwed, but not glued, round the edges on both faces. These segments are for nailing the plywood to the form. After glueing the plywood and nailing to the form, the segments are removed by pulling each separately from the nails. The edges with nails through are cut off with the saw and the wall ground to the depth of the form.

The flange, which is built up to ½ in. thick, is now marked off to the outside and inside dimensions, the inside is cut out with a jig saw and ground to size. It is now nailed to the walls of the pattern, then built up round the body to the thickness of 1 in., including the front of the footstep in one piece. The inside piece of the flange is now used for the back, glued and nailed into place. The fact that plywood is constructed of a number of thin layers of wood calls for very great care, when nailing into the edges, that the nails do not act as a wedge and force the layers apart. This difficulty is overcome by drilling with a small hand drill to the size of the nails.

A pattern is essentially a moulding tool. As a tool, its serviceability must always take precedence over its rank as a "work of art." In this pattern of a gearbox, one must agree that as a "work of art" it has great serviceability, obviating the necessity of building a corebox. It leaves its own core and results in greater accuracy in the bosses as compared with the setting of a loose core. This has been proved by experience. No mention of the cover is necessary, as this is contructed on a joint plate.

Publication Received

Annealing and Heat-Treatment of Aluminium. The British Aluminium Company, Limited, of Adelaide House, King William Street, London, E.C.4, following their well-known and much-appreciated policy of helping manufacturers of aluminium products, have now devoted a brochure (No. 391H) exclusively to this aspect. About half the booklet, which occupies 16 pages, is devoted to matter germane to foundry practice. A strong warning is addressed to foundrymen rigidly to adhere to specificational limits when considering the question of heat-treating castings, and the reviewer can endorse this advice. This, as is all other publicity matter issued by the British Aluminium Company, is available to readers on request to that company.

A second publication, received by the same post, covers the subject of jointing, and here adequate space is given to the welding of aluminium-alloy castings. The requisite precautions to take are still insufficiently appreciated by many otherwise skilled welders.

D

The New Mechanised Foundry of R. A. Lister & Company, Limited

FEATURES OF THE INSTALLATION AT DURSLEY

A study, spread over several years, of the potentialities of what has become to be known as the mechanised foundry, convinced the directorate of R. A. Lister & Company, Limited, of Dursley, Gloucestershire, that many of the advantages to be expected from such installations are neutralised unless the plant envisaged is adequately housed. Thus, the decision to build an entirely new foundry was taken. The new building, which is 360 ft. long by 170 ft. wide, 32 ft. high to the eaves, and has a total content of 2,760,000 cubic feet, is in every way ideal for the purpose it is designed to serve. The natural lighting is at a maximum, and water connections and duck boards have been provided along the roof to facilitate cleaning. Artificial lighting is provided by Osira mercury vapour lamps, giving a general illumination of 10 f.c. Heating and ventilating has had proper consideration, and the Standard & Pochin Bros., Limited, of Leicester, have installed their system of unit heaters. Throughout the whole of the plant, every point requiring lubrication is painted red, a feature well worth emulation by every foundry.

Handling Raw Material

As will be seen from the lay-out drawing, Fig. 1, a siding from the London Midland & Scottish Railway runs along one side of the foundry building, and enters the foundry at the back of the cupolas. On the opposite side is a well-surfaced road, suited in every way for the reception of material carried by road transport. Metallic raw materials are discharged by a 1½ ton magnet (Electromagnets, Limited), suspended from a 3 ton Morris crane. The pig-iron and scrap are discharged into steel-plate bins provided with timber floors. As will be seen from Fig. 2, which shows the appearance of the raw materials arrival end of the foundry, its aspect is very different from that of the average foundry, and in truth has converted the usually untidy stock yard into a neat stores. An outstanding feature is the encirclement of the metal stores by a light railway upon which run wheeled skips designed to work in conjunction with a Morris cupola charging machine. Moreover, the metal stores are intersected with roads, and by means of turntables inserted in the rail-track, each bin is easily served by the wheeled trucks. Before any material arrives at the charging machine, its container passes over either of two Avery automatic dial type weighing machines, so that an exact account of the weight of every charge entering the cupola is registered. Whilst the bulk of the ferrous raw materials for melting consists of material bought in the open market, there is also to be thought of the not inconsiderable amount supplied by the foundry itself, in the form of runners and risers essential to the manufacture of castings and that created through the normal manufacturing processes of any large engineering concern, into which category, of course, enters the Lister Works at Dursley. The method adopted for this internal transport is highly to be commended on account of its simplicity. At the source of the creation of scrap, a large steel container, standing on four short legs, is placed for its reception. Periodically, a Lister petrol truck places its two horizontal beams beneath it; the operator works a lever for jacking up the weight and transports to the place of its re-use in the metal stores, where a simple release automatically places the container on the ground. Cast iron turnings and borings are filled into thin sheet steel canisters, and for packing jarred in much the same way as a grocer treats a packet of sugar. After inserting a disc, the top edge is hammered inwards to transform what is a drug on the market into a really worth-while raw material.

Sand Arrival

The other major raw material in foundry practice is sand, and, as shown in Fig. 1, trucks come to rest on the siding opposite a monorail which spans it. Bottom-emptying buckets, suspended from an electrically-driven crab, are lowered on the truck, filled by hand and brought through an opening in the foundry wall to fill the appropriate bin. This operation is clearly shown in Fig. 3. The closure of these bins is worth noting, as it consists of a series of wooden laths loosely set in slots at an angle of about 45 deg. The system presents the essence of simplicity, and affords easy access in case of "hanging." It is this type of detail which goes such a long way in ensuring the success of modern industrial enterprise.

Charging the Cupolas

The scrap, pig-iron, coke, limestone and ferro alloys having been weighed, their container is pushed so as to engage with a charging machine of a mobile character so as to serve two furnaces. The machine is so designed as to enable the charge to drop into the cupola quite gently, and this action helps to lengthen the life of the refractory brick walls of the cupola. Essentially the charger consists of a lift suspended from rails running on either side of the rectangular aperture in the cupola platform, which enables it to serve either furnace. The loading buckets enter the cage, are raised and racked out, involving turning over to emptying angle. At the cupola door a baffle plate is suspended, which effectually prevents the charge impingeing on the back wall. On the cupola platform, which is of ample size, further weighing facilities are provided; moreover, a width of several feet along its length is spanned by the overhead crane, which enables material destined to be hand-charged to be stored thereon.

Cupolas

To provide for future extensions, provision has been made for four cupolas, but as the plant is still new—it has only been in operation a few months—two only have been installed. They are of the balanced-blast type and have been manufactured under licence from the British Cast Iron Research Association by Geo. Green & Company, of Keighley. These are of the standard 6-ton an hour type, except that the charging door has been modified to permit of both machine and hand charging. They are operated on alternate days, so that patching of the lining can be effected. A rack is provided on the stanchion for carrying the tap-hole tools. As this foundry operates entirely on synthetic sand, this material is used on the hearth of the furnace with unquestioned success.

Sand Handling

To produce a ton of castings in an ordinary jobbing foundry several hundred tons of material have, through rehandling, to be moved. The outstanding commodity in this direction is the moulding sand, and by far the most important source of supply is that which emanates from the knocking out of cast-up moulding boxes. In a mechanised foundry this is, by diverse means, concentrated at one centralised position. At the Dursley foundry, the moulding boxes containing the still hot castings, and the sand, arrive on a platform conveyor to the knockout. Here, after removing any runner bushes, the steel moulding boxes, most of which are of special design made by Sterling Foundry Specialities, Limited, are removed by hand from the conveyor and emptied over a grating. The castings so released are filled into containers to be taken to the cleaning department, and the boxes are attached to a pendulum conveyor, which returns them to the moulders. Some of the boxes are too heavy to be lifted by hand and a pneumatic crane is utilised for the handling.

The sand passing through the grate drops on to a 6-ft. diameter rotating plate where it is ploughed off on to the centre of a 2-ft. wide belt running between 14-ft. centres. The belt feeds a magnet designed by Electromagnets, Limited, for removing all tramp iron which may con-

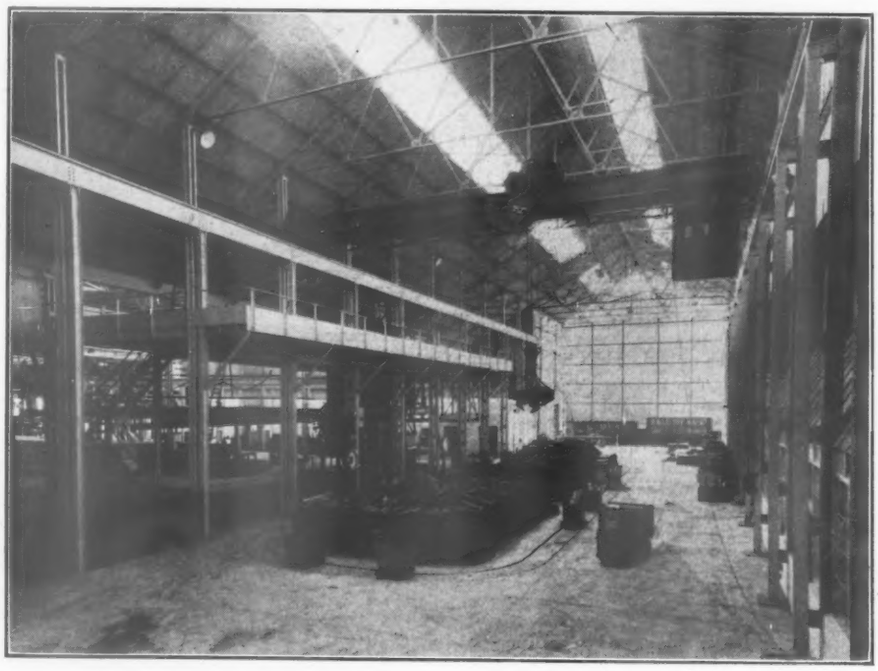

FIG. 2.—THE METAL STORES, CUPOLA PLATFORM AND MELTING PLANT.

taminate the sand. The sand then automatically drops into a bucket conveyor. This conveyor, which forms what is virtually a vertically-disposed square, consists of a series of interlocking 2-ft. by 2-ft. buckets suspended between chains. Installed above this conveyor is the coal-dust hopper covered by the plate shown centrally in Fig. 4. It, too, is provided with a rotating plate for ploughing off the coal-dust into the buckets. The conveyor elevates the sand, as is shown in Fig. 5, along the top of a 6 ft. long by 4 ft. dia. cylindrical rotating screen of ¾-in. mesh. When the buckets reach the hopper for feeding the interior of this, they are automatically tipped. The screening effects a separation of hard cores and extraneous matter such as cardboard, paper and the like which drop down a shute to fill a container designed to be moved by a Lister truck. The screened sand falls into the large hopper shown in Fig. 4 which holds about 40 tons of sand. At its base there is a rotating plate similar to that installed at the knockout, and from it the sand is ploughed off into the horizontal mill also shown in Fig. 4. Internally, this continuous mill contains a pair of rollers set horizontally, the distance between them being controlled by springs. The interior of the casing carries a series of steel shelves for taking the sand repeatedly from the bottom of the mill to the top and refeeding it continuously until the angle of the mill automatically effects evacuation. Here provision is made for adding predetermined measured quantities of water and, by means of the hopper shown at the extreme left, additions of new materials to bring the sand up to standardised conditions. Synthetic sand is used exclusively and this and its control will form the subject of discussion later. Since the photograph reproduced in Fig. 4 was taken, provision has been made for the prevention of sand adherence to the casing along the shelving referred to by the functioning of a series of hammers, the motion being effected by means of simple eccentrics along the external periphery of the casing.

The milled sand is fed into the boot of a high-speed bucket elevator, enclosed in sheeting. In the casing an opening is provided near the base so as to give a chimney effect, for a major problem in the conduct of a mechanised foundry is the cooling of the repeatedly used sand, of which there will be something of the order of 75 tons in the system. This bucket elevator feeds the sand into an aerator shown above the switch panel in Fig. 5. The object of this aerator is to break up the sand into its constituent grains or small aggregations thereof, and this is effected by the centrifugal throwing of the sand at high speed through a series of suspended prongs. To prevent sticking the apparatus is hinged at one end and rotating eccentrics mounted at the other end cause a continual jarring action to be given.

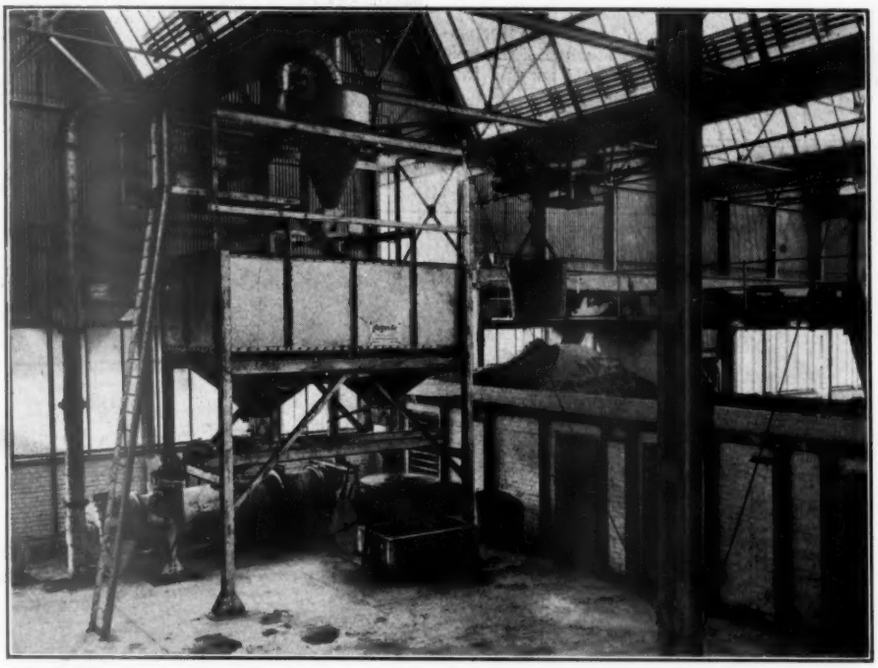

Fig. 3.—Core Sand Preparation Plant and Method of Filling Storage Bins.

The prepared sand is fed on to the flat elevating belt conveyor shown in Fig. 5. It is 2 ft. wide and runs at 100 ft. per minute between 52 ft. centres. This belt spills the sand against a deflector, so as to prevent the sand adhering to the actual scrapers of a push-plate conveyor, which spans hoppers situated above the moulding machines. The scraper conveyor consists of a series of vertically-disposed plates, 22 in. by 8 in., set at 2 ft. intervals between two moving chains. It rides in a channel along the length of which are holes closable by means of shutters. Every fifth plate carries a serrated edge to prevent the formation of a layer of sand on the channel, whilst its neighbour is weighted to keep the scrapers well in contact with the pathway. Beneath the holes are ten sand hoppers, and one which feeds a belt running at right angles to the line of the plant to feed two hoppers placed above two large Osborne machines destined to make, in a side bay, the largest types of repetition castings. This bay is served by a 5-ton Morris overhead electric travelling crane. When the first hopper is full, the conveyor fills each one successively. Naturally, those machines taking the most sand are situated nearest to the source of supply. If all the hoppers be full, then the surplus sand drops down a shute to meet the spillage conveyor. The working places around the moulding machines are formed of a grating, and any sand spilt during the operation of filling moulding boxes, falls through this on to a flat belt conveyor, which spills its contents on to the short length of conveyor serving the knockout. Additionally, as is shown in Fig. 6, moulds made by the big machines (not installed at the time of taking the photograph but to be served by the two hoppers illustrated at the right) are knocked out over the grating at the extreme right. The conveyor belt serving this knockout passes beneath the semi-circular tub-like guard illustrated, to feed its contents on to a returned sand belt spilling its load on to the short length of conveyor situated at the main knockout at the far end of the shop. Thus there is an auxiliary sand circuit to take care of castings involving moulding boxes too large to be placed on the mould conveyor.

Moulding Plant

At the side of the mould conveyor and serviced by the scraper flight conveyor are nine moulding machines, all of which are operated by compressed air. Amongst the types included are Zimmermann, Britannia, Osborne and International. The last is of a portable character, and only needs connecting up with the air line. The hoppers placed immediately above the machines have the clam-shell type of closures. In several

Fig. 4.—Part of the Sand Preparing Plant, including the Storage Hopper, Mill and Enclosed Bucket Elevator.

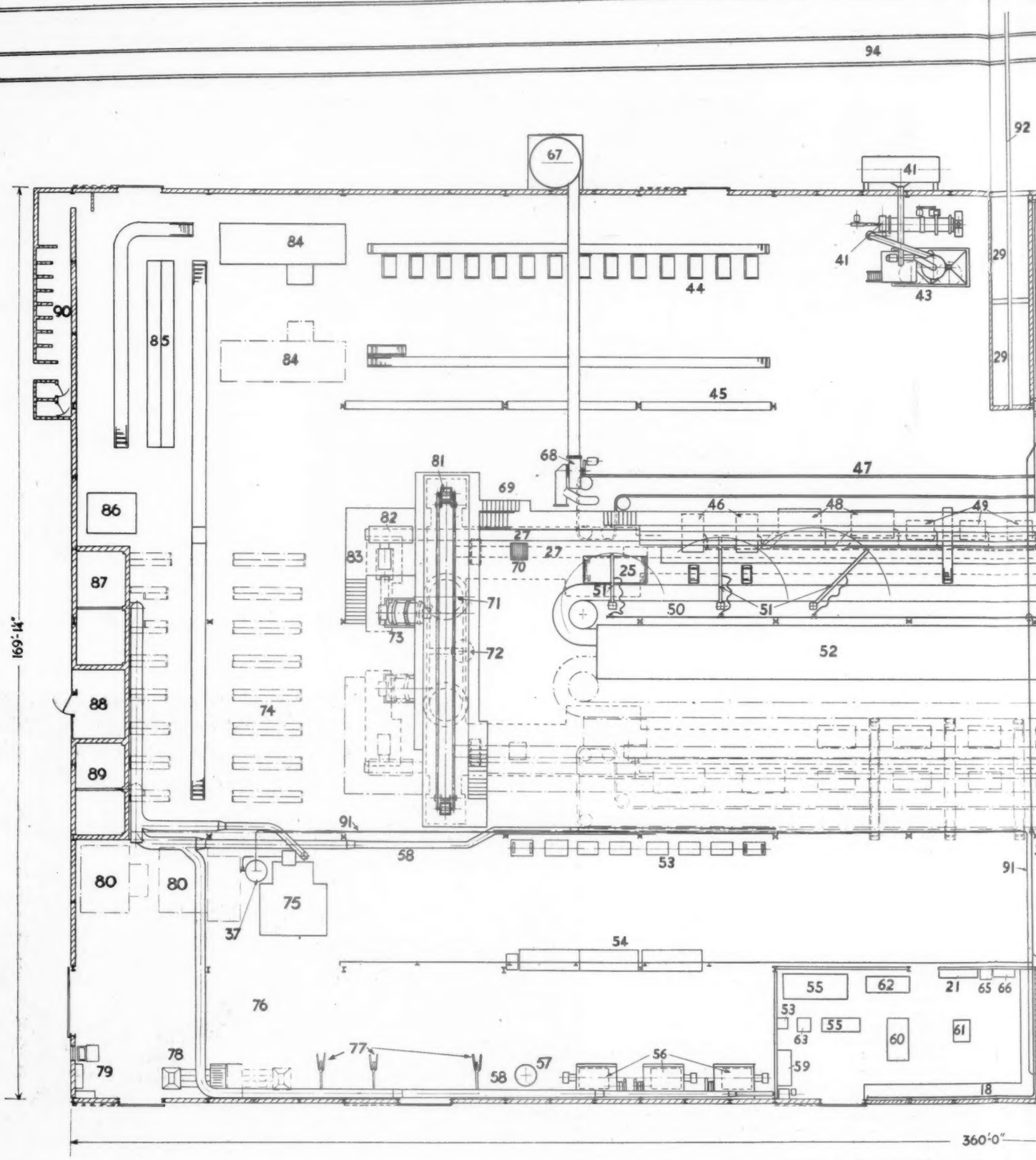

Fig. 1.—Arrangement of

1 = Dark room.
2 = Balance room.
3 = Sand testing.
4 = Laboratory.
5 = Fume extraction fan.
6 = Storage bins.
7 = Track for charger trucks.
8 = Firing pit.
9 = Stack.
10 = Core stoves.
11 = Blast fan.
12 = Spare ditto.
13 = Cupola.
14 = Cupola platform.
15 = Charger opening.
16 = Metal pattern stores.
17 = Offices.
18 = Bench.
19 = 600-gall. water tank.
20 = 1,000-gall. ditto.
21 = Racks.
22 = Mono-rail for ladles.
23 = Pouring platform.
24 = Drive.
25 = Knock-out.
26 = New sand.
27 = 24-in. belt conveyor.
28 = 24-in. conveyor belt.
29 = Sand bin.
30 = Moulding machine.
31 = Moulding machine.
32 = Mould conveyor.
33 = Double-deck cloakroom.
34 = Washing trough.
35 = High-pressure air main, 100 lbs. per sq. in.
36 = High-pressure air compressors.
37 = Air receiver.
38 = Low-pressure air compressor.
39 = Air filter.
40 = Water tanks.
41 = Bag filter.
42 = Sand drying plant.
43 = Rotoil mixers.
44 = Core benches.
45 = Core box racks.
46 = International portable moulding machines.
47 = Empty box conveyor.
48 = Osborne 403 moulding machines.
49 = Zimmermann U.G. moulding machines.
50 =
51 =
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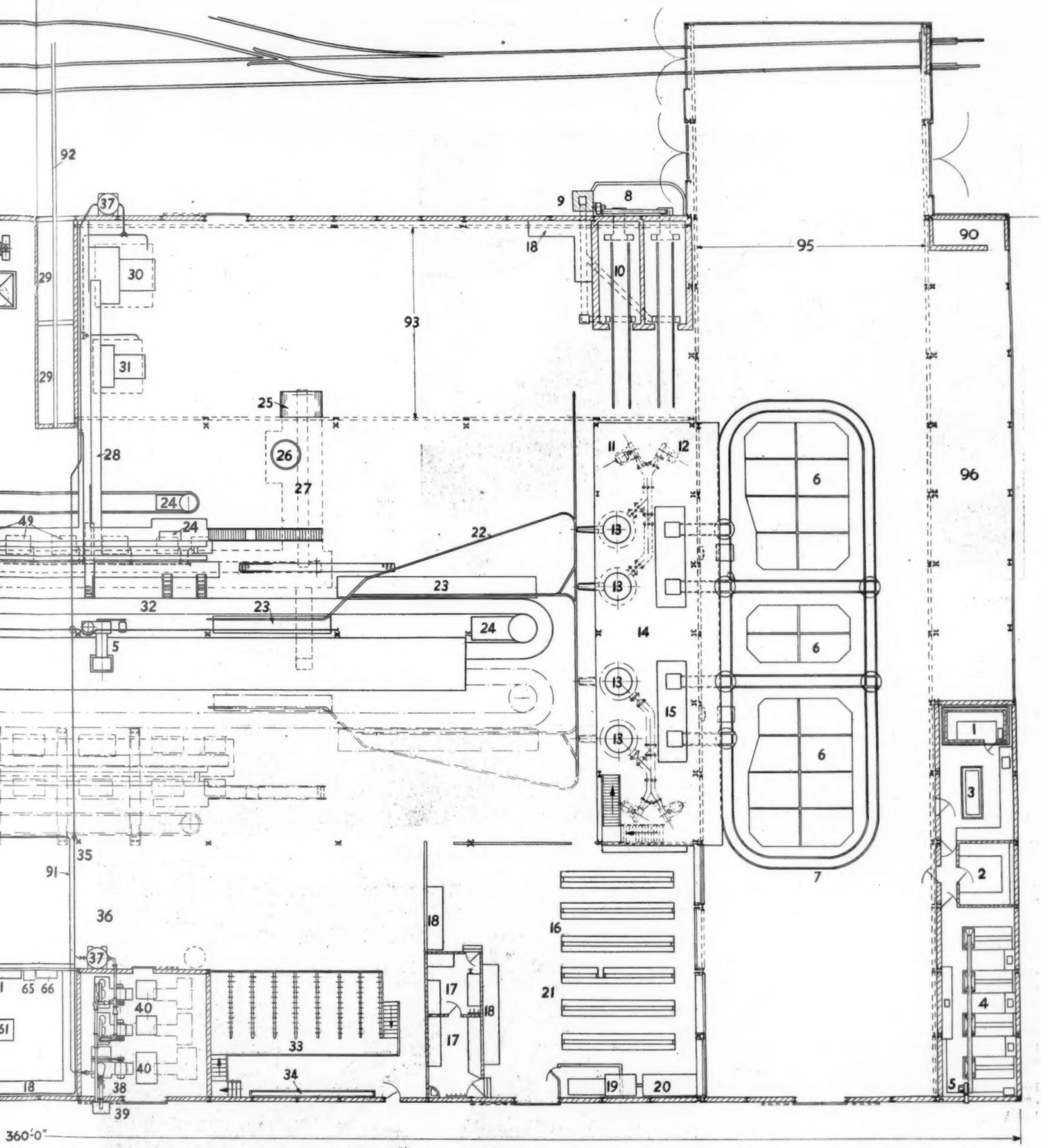
57



GEMENT OF THE NEW FOUNDRY.

50 = Split sand grid.
51 = Pneumatic jib cranes.
52 = Fume hood.
53 = Grinders.
54 = Fettling benches.
55 = Lathe.
56 = Barrel rumblers in sound-proof housings.
57 = Surface grinder.
58 = Dust-extracting pipe.
59 = Millwrights' bench.
60 = Shaper.
61 = M.O. table.
62 = Radial drill.
63 = Sensitive drill.
64 = Grinder.
65 = Desk.
66 = Lockers.
67 = Settler.
68 = Fume extraction fan for knock-out.
69 = Overband separator.
70 = Surplus sand grid.
71 = 40-ton hopper.
72 = Coal-dust hopper.
73 = Mill.
74 = Core storage racks.
75 = Shot blast.
76 = Core knock-out.
77 = Swing grinders.
78 = Sand elevator.
79 = Main-feed pillar and switch-gear.
80 = Sand-blast.
81 = Pivoted bucket conveyor.
82 = Disintegrator.
83 = Elevator.
84 = Continuous core-drying stove.
85 = Jointing benches.
86 = Acme Junior stove.
87 = Dust-extraction chamber for sand-blast.
88 = Fan room.
89 = Dust-extraction chamber for grinders and rumblers.
90 = Lavatory.
91 = Low-pressure air main, 30 lbs. per sq. in.
92 = Telpher rail.
93 = 5-ton overhead travelling crane.
94 = Railway siding.
95 = 2½-ton overhead travelling crane.

cases, sleeves of canvas fabric are attached to the openings of the hoppers so that the stream of sand can be deflected evenly along the length of the pattern. This, too, tends to reduce spillage to a minimum. The boxes are received from the knockout by a pendulum conveyor. Several of the machines work in pairs, the one making copes and the other the drags. In general, the castings made are quite complicated, and involve the use of large quantities of cores, and the essential pause in continuity of operation is provided by the interposition of a short length of roller pathway between the machines and the mould conveyor for core setting, gauging and inspection. In general, the moulds are not weighted, but the two halves are clamped together. Where called for and to ensure solidity in the castings, the management has devised a system of incorporating between the runner and the actual casting a "shrink bob." Because of its mass, it remains fluid longer than the greatest section and so acts as a reliable feeder.

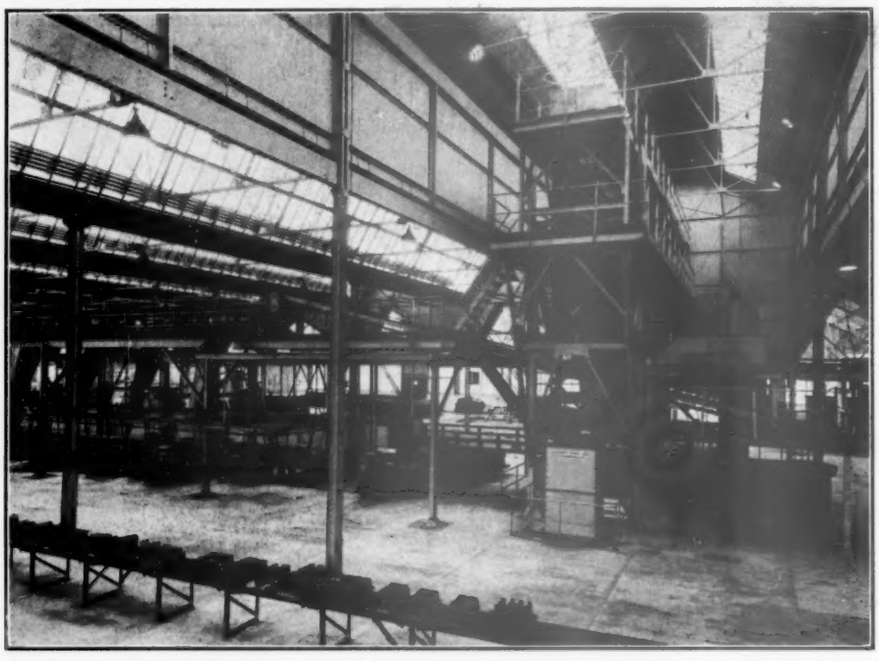


Fig. 5.—More of the Sand Preparing Plant, including the Bucket Elevator and the Aerator. On the left is the Moulding Plant.

The mould conveyor consists of a series of 3 ft. 3 in. by 3 ft. cast-iron plates drawn along by a moving chain at speeds varying to a maximum of 12 ft. per min. The plates carry grooves so that gas generated at the lower part of the mould may find ready means of egress. The mould conveyor carries the moulds towards the cupola, where they are cast up. Then returning back along a parallel path the cast-up moulds pass beneath a hood. This hood, from which air is drawn, serves the dual purpose of providing a means of cooling the sand and at the same time preventing the escape of steam and gases into the atmosphere of the foundry.

As the hooded section of the conveyor is 155 ft. long, there is ample time for cooling to be effected, and on emerging the moulds are at the knocking-out position.

Core Preparation

Sand taken from the bins shown in Fig. 3 is charged into the gas-fired rotating cylindrical dryer designed by Augusts, Limited, and illustrated in the background. By pneumatic means it is conveyed through the piping shown, to fill one of a pair of hoppers situated directly above Rotoil mixers, only one of which had been installed at the time of taking the photograph. During the pneumatic conveying of the dried sand, a certain amount of fine dust is eliminated, which ameliorates the quality of the sand. At the mill, linseed oil or other agglutinant is added, and after a quite short period of mixing, the oil-sand mixture is bottom-discharged into a container. These containers are placed on a series of coremakers' steel-lined benches. The green cores are disposed upon carriers, that is, plates which, where necessary, carry the conformation of a portion of the core so as to prevent distortion during transport in the green state. These carriers ride on a long length of roller path along which they are pushed until they reach an Acme drying stove; this stove, which is coke-fired, consists essentially in a series of hanging trays suspended between two specially designed chains which carry the load into the stove, then upwards for a gentle drying, down again and then upwards again into a second baking chamber, and finally downwards to delivery on the opposite side. Here the cores are removed, inspected, and blacked, and then placed in a single-chamber Acme stove for drying the blacking. In this case the delivery is at the point of reception. The cores are then transferred by rubber-wheeled bogies to the core setters, working on the roller path between the moulding machines and the mould conveyor.

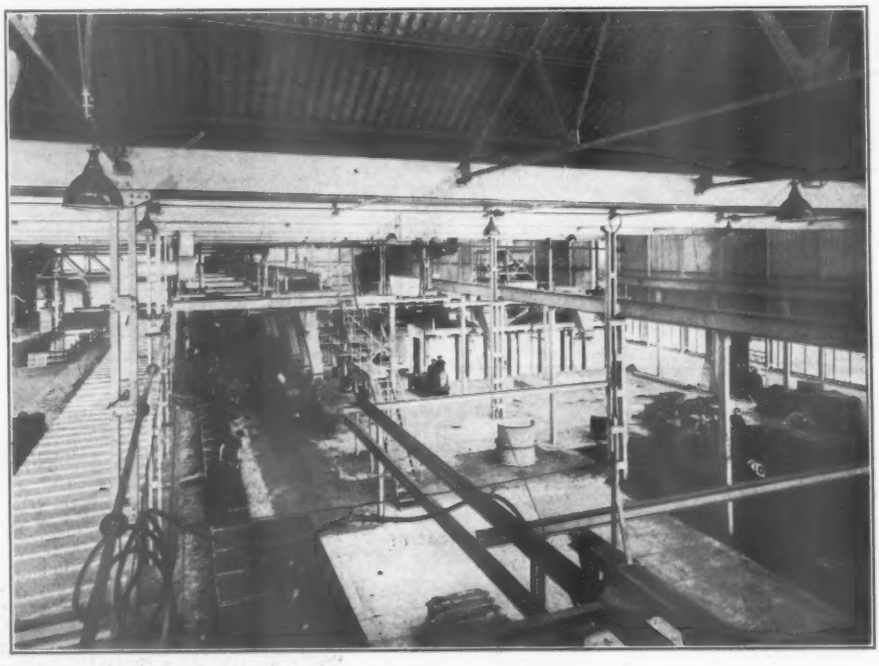


Fig. 6.—General View of the Plant from the Cupola End of the Shop.

Cleaning the Castings

Not all castings require exactly the same treatment before being taken to the machine shop. For some, mere passage through a rumbler suffices. These rumblers consist of rotating perforated barrels, enclosed in an external casing, and an exhaust is provided to collect the dust so formed. The position of this plant is shown in Fig. 1. Other castings, mainly of a heavier character, require sand blasting, and for this purpose two rooms, 12 ft. by 10 ft., have been installed. Flash and irregularities caused by the removal of runners and risers are removed by a series of double-ended grinders by F. E. Rowland & Company, Limited. These are of the two-speed type, so that, as the wheel wears away, the throwing over to a higher speed maintains the original peripheral wheel speed. Additionally, and a rather unusual feature for a fettling shop, surface grinders are to be installed, which should tend to minimise much work now effected by the machine shop. Finally, the larger castings carry heavy cores, and as this material is not suited for entering a mechanised system, it is charged on to a vibrating screen, and the iron is recovered, whilst the material passing through is filled into the boot of a hopper, from which it is discharged by bucket elevator into trucks for removal to the rubbish dump.

Pattern Plates

The existence of a mechanised foundry demands the provision of a class of metal pattern plates of the highest possible quality. These constitute an important capital outlay. The pattern-shop has now become the jig and tool department of the foundry, and its products demand equal care in storage. Thus, a special stores has been created within the foundry building, and racks have been designed so as to conserve space, whilst at the same time affording ready

(*Concluded on page* 354.)

BALLARD Industrial Ovens

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Forced air circulation is necessary to guarantee equable temperatures in all parts of the oven, and to dry all the cores uniformly. With this system the drying is not only more efficient but is accelerated.

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PHOSPHORUS	·06%

WARNER & CO., LTD
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Institute of British Foundrymen

LONDON BRANCH ANNUAL MEETING

The annual general meeting of the London Branch of the Institute of British Foundrymen was held on April 6, 1938, the retiring Branch-President (Dr. A. B. Everest) being in the chair.

The minutes of the preceding annual general meeting were taken as read, and were confirmed and signed, as were the minutes of the last two ordinary meetings of the Branch.

Annual Report

Mr. R. Causebrooke (Hon. Secretary) presented his report on the work of the Branch during the 1937-38 session, which showed that the session had been successful and that the membership had increased to 312, as compared with 308 the previous year. In view of the fact that five or six more members had been transferred to other Branches than had been transferred to the London Branch, and that the names of fourteen members had been deleted from the records through circumstances beyond the control of the Branch, it would be agreed, Mr. Causebrooke said, that the expansion had been very satisfactory. Whilst the Branch income had been slightly less than in the previous year, the expenditure also had been less.

A well-varied and interesting group of lectures had been presented during the session; and the joint meeting with the Birmingham Branch, at Birmingham, was a very successful function, visits having been made to three of the well-known foundries in the district. He believed the attendance at the annual dinner of the Branch in December, 1937, constituted a record, the principal guest being the Rt. Hon. J. H. Thomas, P.C. In December also members of the Branch were entertained by the London Section of the Institute of Metals, and approximately 130 members and friends of both Institutes had attended that meeting.

He was pleased to report that the East Anglian Section was still expanding, and its membership had increased from 48 to 52. He took the opportunity to congratulate Mr. J. L. Francis, the honorary secretary of the Section, upon his valuable work. In conclusion, he expressed his sincere thanks for the assistance given to him, in an office which to him was new, during a somewhat strenuous year.

The Branch-President commented that the report was very satisfactory, and showed that another record in membership had been achieved. The Branch developed from strength to strength, and the financial position was eminently satisfactory. There had been some improvement in the attendance at meetings, but there was room for further improvement in that respect, for the Branch members numbered more than 300.

On the motion of Mr. C. C. Booth, J.P., seconded by Mr. G. C. Pierce, the report was unanimously adopted.

ELECTION OF OFFICERS AND COUNCIL, 1938-39

Branch President

The Branch-President proposed the election of Mr. C. C. Booth (Branch-Vice-President) to the Branch-Presidency, and referred to him as a man possessing unique qualities. Primarily he was a foundryman, and a very well-known foundryman. Further, he was a keen sportsman (particularly a yachtsman), and he was also a Justice of the Peace, so that under his presidency the Branch should enjoy a very peaceful year.

Mr. V. C. Faulkner seconded, and Mr. Booth was unanimously elected.

Mr. Booth, expressing thanks for his election, said he had a difficult task to follow so able a man as Dr. Everest, but he would do his best to further the interests of the Branch.

Senior Branch Vice-President

Mr. Booth proposed that Mr. Barrington Hooper, C.B.E., the Junior Vice-President, be elected Senior Vice-President. He acknowledged the great help which Mr. Barrington Hooper had rendered the Branch in the past, and said it was hoped that he would succeed to the presidency of the Branch in the following year, when the International Foundry Congress would be held in London.

Mr. H. W. Lockwood, who seconded, also paid a tribute to Mr. Barrington Hooper for his very hard work in the interests of the Branch.

The motion was carried unanimously, and Mr. V. C. Faulkner responded on behalf of Mr. Barrington Hooper, who was unavoidably absent.

Junior Branch Vice-President

Mr. C. H. Kain proposed that Mr. H. W. Lockwood be elected Junior Vice-President, as recommended by the Branch Council, and said his virtues were well known to members of the Branch, and there could be no doubt as to the zeal with which he would continue to serve the Branch as he had done in the past.

The resolution was seconded by Mr. A. Turner, and carried unanimously.

Mr. Lockwood, expressing his thanks, said that the six years during which he had had the honour of serving as hon. secretary of the Branch were among the happiest of his life, and he hoped to be able to serve adequately as a Vice-President.

Hon. Secretary

Mr. C. C. Booth said that Mr. R. Causebrooke, who had served the Branch as hon. secretary during the past year, had felt bound to offer his resignation, in view of his business responsibilities, and the Council had very reluctantly accepted it. Mr. Dalglish, who had recently become a member, was willing to serve in that capacity, and the Branch was indebted to Mr. Lockwood for having made that possible. Mr. Dalglish was a keen worker, and had a good knowledge of ironfoundry practice and of metallurgy.

Mr. Causebrooke seconded the election of Mr. Dalglish, whom he had known for a considerable time, and wished him every success in his new office. The resolution was carried unanimously.

Mr. Dalglish, responding, said he would do his best for the Branch as a whole and for each and every one of its members.

Members of Council

The following were elected to fill the four vacancies:—Mr. A. Turner; Mr. H. J. Cree; Mr. J. N. Burns, and Mr. A. Young.

Other Elections

Mr. A. R. Bartlett and Mr. Cleaver were re-elected as honorary auditors; Mr. C. H. Kain, Mr. H. W. Lockwood and Mr. B. B. Kent were elected as delegates to General Council, and Mr. C. H. Kain and Mr. A. J. Murphy as representatives of the Branch on the Technical Committee.

Vote of Thanks

Mr. C. C. Booth proposed a hearty vote of thanks to Mr. R. Causebrooke for his excellent work as Hon. Secretary of the Branch during the past year. He had worked very hard, and his valuable help had been very greatly appreciated. The Council had been exceedingly sorry to learn that he had to resign by reason of his business responsibilities.

The Branch-President took the opportunity to second, and expressed his appreciation of the support which Mr. Causebrooke had given him during the past year. The Branch-President said that, by reason of his own experience as Branch Hon. Secretary (an office which he had held for only a year), he could assure the Branch that it entailed exceedingly hard work. During Mr. Causebrooke's year of office the membership had been at a maximum, the amount of money that had passed through his hands was greater than in previous years, and the amount of work involved had been very great. The vote of thanks was carried with acclamation.

Mr. Causebrooke, responding, thanked the officers and members of the Branch for the support they had afforded him during his period of office. He regretted that he had had to resign, but owing to circumstances beyond his control, he had no alternative.

Mr. G. E. France then gave an address on "Mechanisation."

A hearty welcome was extended to Mr. Miller, of the South African Branch of the Institute, who attended the meeting, and the Branch-President asked him to convey the hearty greetings of the London Branch to the South African Branch.

Mr. Miller said he was thoroughly enjoying his visit to this country, and would be happy to convey to his colleagues in South Africa the good wishes of the London Branch.

The New Mechanised Foundry of R. A. Lister & Company, Limited

(*Concluded from page* 352.)

access to each pattern. The system consists essentially of a series of cast-iron plates carrying vertical equally spaced rectangular ledges on either side, the horizontal spacing being such that standard 12 in. by 14 in. pattern plates can be carried with a maximum occupation of available room.

Sand Control

As briefly indicated, this foundry has standardised on the use of synthetic sand; this means that instead of using the naturally clay bonded material, a clay-free sand—of the silver sand variety—is mixed with a colloidal clay. Generally speaking, two varieties are available in this country, bentonite and Colbond. The former comes from America, whilst the second is from Eire. One major effect of using these materials is that the system sand is maintained in condition by the addition of a hundredweight or so *per diem*, whereas if resort were made to naturally-bonded sand, the amount added each day would be of the order of 53 cwts. This would more than equal natural wastage and involves the periodical removal of excess. Many people believe that scientific control of the properties of synthetic sand is more easily effected. In this plant, a young executive is constantly employed on the actual plant and reports the compression strength, the permeability and the moisture content of the sand every half-hour. The control is established to yield a sand averaging out at 4 to 5 per cent. moisture; 7 to 10 bond and 50 to 60 permeability. These figures in the form of a graph are prominently displayed for the guide of the management.

Generally speaking, the moisture content of synthetic sands is of the order of 5 per cent. instead of 6 per cent. for the naturally-bonded variety. This really considerable reduction—about 15 cwts. in the system—leads to a lower steam production and so makes for more comfortable working conditions. Exceptionally in this plant, is it found necessary to resort to a special facing-sand, and even when this is done, reliance is still placed on synthetic mixtures.

Conclusion

The general contract for the plant was placed with Herbert Morris, Limited, of Loughborough, to the designs of Mr. F. J. Cook, Past-President, Institute of British Foundrymen, who acted in the capacity of consulting engineer.

The fullest advantage has been taken of the provision of an entirely new shop to install plant which can be relied upon to yield high-grade easily machinable castings, such as are required by agricultural engineers and engine builders at the lowest cost per unit casting, whilst at the same time providing for the operatives clean, healthy surroundings associated with the maximum elimination of "donkey-work."

A.R.P.

(A RARE PATCHING)

"SILACENE"

THOS. E. GRAY & CO., LTD.

119, HIGH HOLBORN,

LONDON.

The Week's News in Brief

Trade Talk

The Tenth International Congress of Chemistry is to be held in Rome from May 15 to 21.

A. C. Wickman, Limited, of Coventry, have opened a branch office at Somerset House, Temple Street, Birmingham. Mr. M. E. Smith is the district manager.

Employees of the Motherwell Bridge & Engineering Company, Limited, are to receive a bonus in the form of a cash payment equal to 10 per cent. of their annual wages.

Forty-four furnaces in the British Aluminium Company's works at Fort William have been closed down as a result, it is stated, of the furnacemen refusing to undertake certain work.

The North British Locomotive Company, Limited, Springburn, Glasgow, have received an order for two locomotives of the 2-8-2 type, also tenders, for the Newfoundland Railway.

The Acoje Mining Company (Marsman & Company, Inc.), of Sta. Cruz, Zambales, Philippines, shipped 5,017 tons of chromite during the month of February. A daily output of 233 tons is being maintained.

The Manchester Association of Engineers is to pay a visit to the works of Linotype & Machinery, Limited, Broadheath, Altrincham, on May 11. The firm, which produces printers' machinery, has its own ironfoundry.

A sub-committee representative of the Welsh Engineers' and Founders' Association and of the West Wales Allied Engineering Trades Committee has drawn up a complete scheme for holidays with pay for workers in the industry. The scheme will be recommended for acceptance by the men at an early date.

The Vienna Sectional Meeting of the World Power Conference will, notwithstanding recent political events, be held between the dates already fixed (August 25 to September 2, 1938), and the programme remains unaltered. At the recent annual general meeting of the British National Committee, it was decided unanimously to proceed with preparations for British participation in the Vienna meeting.

Considerable progress has been made in carrying out at the works of Hadfields, Limited, Sheffield, an extensive programme of improvements, including foundry rearrangement and extensions, additional arc and high-frequency electric melting furnaces, new gantries and cranes for the handling of raw materials, new departments for increased ordnance output, additional forging and heat-treatment facilities, and the installation of machine tools at Hecla and East Hecla Works.

A special course, organised by the Board of Education and conducted by Dr. F. T. Chapman, H.M.I., was held at the British Foundry School from April 19 to 23. About thirty-five teachers from technical and junior technical schools and colleges throughout the country, and including several inspectors of the Board, attended. The object of the course was to consider the most suitable methods of teaching foundry subjects for national certificate and City and Guilds examinations, to review recent advances and to discuss the special difficulties which beset classes for foundry employees. In addition to the discussions, visits were paid to the Midland Motor Cylinder Company, Limited, Smethwick, and to the Midland Electric Manufacturing Company, Limited, Birmingham. Mr. J. G. Pearce (Director of the British Cast Iron Research Association and Honorary Adviser to the British Foundry School) gave the opening lecture on the bearing of recent research on work in the foundry, and Mr. J. Bamford, B.Sc. (Lecturer-in-Charge of the British Foundry School), lectured on facings and on patterns and pattern plates. Other lectures included those on the modern cupola, by Mr. L. W. Bolton; moulding sands, by Mr. W. B. Parkes; the effect of elements in cast iron, by Dr. A. L. Norbury; moulding machines, by Mr. W. Rawlinson; brasses and bronzes, by Mr. J. E. Newson; aluminium castings, by Mr. R. T. Parker, and foundry layout, by Mr. F. J. Cook. Mr. T. Makemson was prevented by indisposition from lecturing on the foundry industry, its development and probable future.

Personal

Sir Malcolm Campbell has joined the board of the Ford Motor Company, Limited.

Capt. G. E. T. Eyston has been elected a director of John I. Thornycroft & Company, Limited.

Mr. John Edward Belliss, Mr. Francis Vincent Everard, and Mr. Alfred Morcom have been appointed directors of Belliss & Morcom, Limited.

Mr. A. C. Gardner, engineer of the Clyde Navigation Trust, has been re-elected President of the Institution of Engineers and Shipbuilders in Scotland.

Mr. E. G. Boissier, director and general manager of Aiton & Company, Limited, pipe founders, of Derby, has become commandant of the auxiliary fire brigade which is being formed under the Derby A.R.P. scheme.

Mr. R. B. Tennent, chairman of R. B. Tennent, Limited, Whifflet Foundry, Coatbridge, whose family has long been associated with the Town Council of Coatbridge, has offered the gift of a chain of office for the junior bailie.

Mr. Henry Ford has been awarded the James Watt International Medal by the Council of the Institution of Mechanical Engineers. The medal is awarded every two years to commemorate the birth of James Watt in 1736.

Mr. Alexander Watson, foreman moulder with the Dorrator Iron Company, Limited, Camelon, Falkirk, has received a presentation of a barometer and walking stick from members of the staff and employees, on the occasion of his retirement after 39 years' service. The gifts were handed to him by Mr. James M'Vey, a moulder. Mr. Tom Scott, managing director of the firm, presided, and referred to the long and faithful service of Mr. Watson.

Sir Harold Hartley, C.B.E., F.R.S., has again been elected chairman of the British National Committee of the World Power Conference, to serve for a further term of three years. He is also chairman of the International Executive Council of the Conference. Sir Harold Hartley is, of course, Vice-President of the London Midland and Scottish Railway Company, Chairman of the Fuel Research Board, Department of Scientific and Industrial Research, and President of the Institute of Vitreous Enamellers.

Mr. W. R. Barclay, O.B.E., immediate Past-President of the Institute of Metals, has accepted an invitation to deliver the Calvin W. Rice Memorial Lecture at the semi-annual meeting of the American Society of Mechanical Engineers, to be held in St. Louis, Missouri, in the week beginning June 20. Mr. Barclay hopes during this visit to the United States to have an opportunity to meet representatives of the metallurgical societies who will act as hosts during the visit of the Institute of Metals and Iron and Steel Institute in the autumn of this year.

Wills

Brodie, R. B., of the Melville-Brodie Engineering Company, Sinclairtown Foundry, Kirkcaldy	£48,742
Watkins, A. J., secretary of Ambrose Shardlow & Company, Limited, forging and stamping makers, of Sheffield	£3,409

Obituary

Mr. W. Maxwell, a moulder in the foundry of John Wright & Company, Limited, Birmingham, who died on April 20, was a well-known athlete before the war. A native of Falkirk, he was 49 years old.

Mr. William Frederick Kerr, who died in a Newcastle nursing home recently, aged 52, was for many years connected with the Dick Kerr Engineering Company, Preston, which later became the English Electric Company, Limited.

Royal Tour of Steelworks

The King and Queen are to visit the Clydebridge Steelworks of Colvilles, Limited, on May 4. Their Majesties will make a tour of the works and see in operation the various processes of steel production.

Company Reports

Murex, Limited.—Interim dividend of 7½ per cent.

Parkinson & Cowan, Limited.—Ordinary dividend of 3 per cent.

Fleming & Ferguson, Limited.—Interim dividend of 3 per cent.

Hopkinsons, Limited.—Final dividend of 10 per cent., making 12½ per cent. for the year to January 31.

Robey & Company, Limited.—Profit for 1937 of £12,476. After providing for depreciation, interest, fees and a reserve for bad debts, there is a credit balance of £53 to carry forward.

James H. Lamont, Limited.—Net profit for 1937, £26,597; brought in, £1,202; income-tax and tax reserve, £6,301; N.D.C., £1,000; general reserve, £3,000; ordinary dividend of 25 per cent. and extra dividend of 2 per cent. on the 6 per cent. participating preference shares; carried forward, £1,048.

C. & W. Walker, Limited.—Profit for year ending January 31 last, £28,754; brought in, £3,955; preference dividend of 7½ per cent., £3,000; dividend on the ordinary shares of 10 per cent., £9,530; bonus of 1s. 9d. per share, £8,339; to general reserve, £2,500; carried forward, £9,341.

Alley & MacLellan, Limited.—Profit for 1937, £38,441; brought in, £7,074; depreciation reserve, £5,648; preference dividend, £5,019; to general reserve, £7,500; income-tax reserve and N.D.C., £3,886; 10 per cent. dividend on ordinary shares, £10,000; 5 per cent. bonus on ordinary shares, £5,000; carried forward, £7,561.

Contracts Open

Hoylake, May 31.—Supply and erection of 100-kw. alternator, driven by medium-speed solid-injection-type oil engine, for the Urban District Council. The Water Engineer, Town Hall.

Wellington, N.Z., June 28.—Two 2-ton portable, petrol-electric or Diesel electric self-propelling cranes, for the New Zealand Public Works Department. The Department of Overseas Trade. (Reference T.20,182/38.)

Shrewton, May 3.—Providing and laying 2¾ miles of spun-iron mains from 6 in. to 3 in. dia., etc., for the Amesbury Rural District Council. Lemon & Blizard, consulting engineers, Lansdowne House, Castle Lane, Southampton. (Fee £5 5s., returnable.)

Applications for Trade Marks

The following list of applications to register trade marks has been taken from the "Trade Marks Journal":—

"Hiduminium (Anticorodal)."—High Duty Alloys, Limited, 99, Buckingham Avenue, Trading Estate, Slough.

"Lymalloy."—Metallic alloys. Wellworthy Piston Rings, Limited, Stanford Road, Lymington.

"Inconel."—Tubes. Henry Wiggin & Company, Limited, Thames House, Millbank, London, S.W.1.

"Pacteron."—Alloys. Powder Metallurgy, Limited, 101, Leadenhall Street, London, E.C.3.

Forthcoming Events

MAY 4.

Institute of Metals:—Annual May Lecture: "Plastic Strain in Metals," by Prof. G. I. Taylor, at Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, at 8 p.m.

MAY 4, 5 and 6.

Iron and Steel Institute:—Annual meeting and Symposium on Steelmaking, at Institution of Civil Engineers, Great George Street, London, S.W.1, at 10 a.m. Annual dinner on May 5, at Grosvenor House, W.1, at 7 p.m.

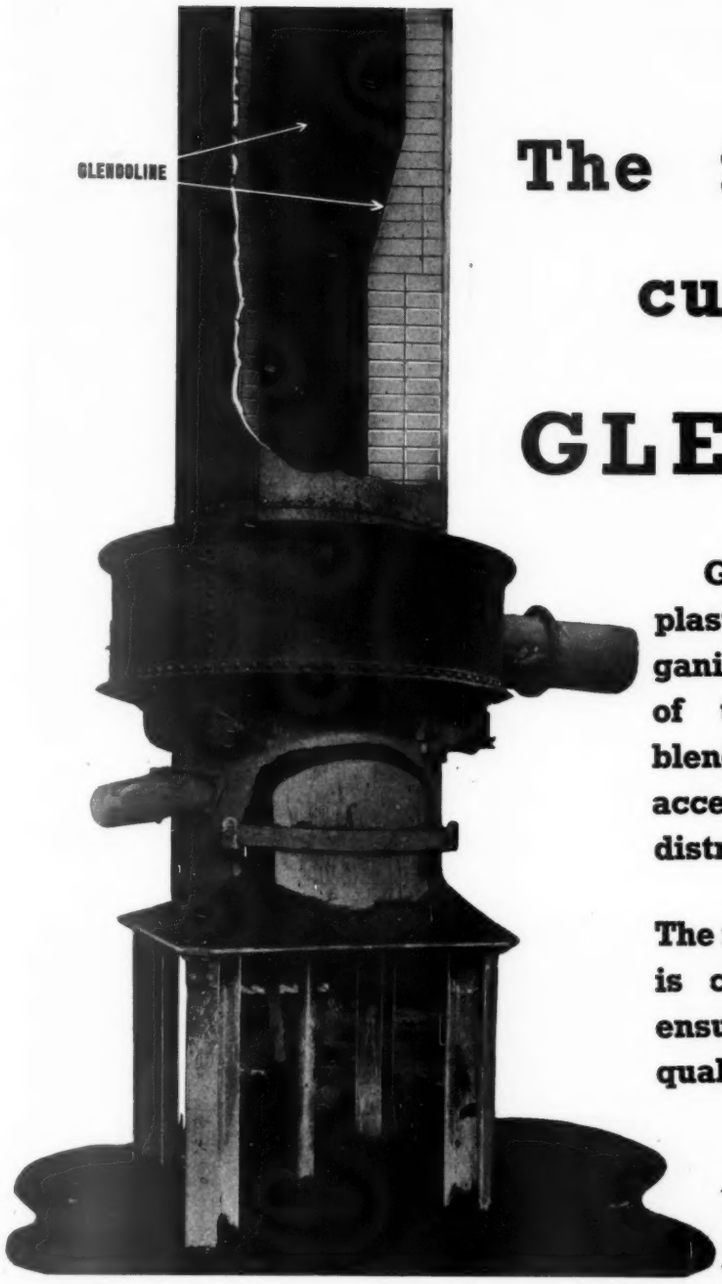
Institute of British Foundrymen

APRIL 30.

West Riding of Yorkshire Branch:—Annual general meeting, at Technical College, Bradford, at 6.30 p.m.

MAY 10-12.

London Branch:—West Country visit, to Petters, Limited, Yeovil; Westinghouse Brake & Signal Company, Limited, Chippenham; Newman, Hender & Company, Limited, Woodchester, and Great Western Railway Works, Swindon.



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The mixing and grading of Glendoline is controlled to a definite formula, ensuring dependable and uniform quality.

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★ HIGHLY REFRACTORY
★ GREAT MECHANICAL STRENGTH

★ This photograph of a cupola, shows a portion of the lining and the positions where Glendoline is recommended for lining and patching.

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MANCHESTER OFFICE: 9, Albert Square. Telephone: Blackfriars 6130 Telegrams: "Genefax, Manchester." (Mr. S. G. Throssell).

MIDDLESBROUGH OFFICE: Halifax Bldgs., Exchange Place, Telephone: Middlebrough 3313. Telegrams: "Genefax, Middlesbrough." (Mr. J. A. Williams).

CARDIFF OFFICE: 17, Windsor Place, Telephone: 5796. Telegrams: "Genefax, Cardiff." (Mr. F. E. Rutter)

BIRMINGHAM OFFICE: 5, Lower Temple Street. Telephone: Midland 6376. Telegrams: "Genefax, Birmingham." (Mr. G. Griffiths)

Raw Material Markets

Although the production of foundry iron has been considerably lower of late, additional blast furnaces are likely to be put out of action in the near future, as there are no indications that consumers will find it necessary to take up further tonnages for some time to come. Most consumers are well stocked and, even should consumption expand, it will be a long time before stocks are cleared.

Pig-Iron

MIDDLESBROUGH.—Owing to the difficulty experienced in disposing of the current output of foundry iron, makers are taking steps to ensure that stocks do not mount to unmanageable proportions. At present, many consumers are supplied with large tonnages of Midland and Continental iron, and until these supplies are worked off, there will be no change from the current quiet conditions ruling in the market. The official intimation that the import duty on foreign pig-iron will be reimposed has still to be received, but no iron is now coming to this area from abroad. The lack of orders from Continental consumers continues to cause anxiety; it is, unfortunately, unlikely that there will be any change in this respect for a considerable time. For delivery to Middlesbrough or Falkirk, No. 3 Cleveland G.M.B. foundry iron is quoted at 109s., less 5s. per ton rebate.

Production of hematite continues to be more than sufficient to cope with the demand, despite the fact that a further decrease has recently been made in the number of furnaces in blast. Makers are despatching deliveries under contracts, but in most cases users are having to put supplies into stock. Few export orders are coming to hand, and the absence of this business is severely felt in this district. It is hoped that more orders will be forthcoming from Italy as a result of the recently-concluded Anglo-Italian pact.

LANCASHIRE.—Although there has been little expansion as yet, signs are not wanting that there will shortly be increased activity among the light-castings makers. This should bring about a welcome improvement in the consumption of pig-iron in this area. Light-castings foundries have been unsatisfactorily employed for a long time past. Machine-tool makers and heavy electrical engineers are fairly well employed, while general engineers and jobbing founders are in a moderately good position. Concerns engaged on the production of specialities are receiving a good number of orders. There is still little improvement in the demand for hematite. For delivery in the Lancashire price zone, Staffordshire and Derbyshire No. 3 qualities are quoted on the basis of 114s., with Northants at 112s. 6d. and Derbyshire forge iron at from 111s. to 113s.

MIDLANDS.—The foundry-iron market in this area remains very quiet. Most of the light-castings makers continue to work short time, while a few have closed down altogether. Other consumers are refraining from taking up additional tonnages, contract deliveries being more than sufficient in most cases to meet present requirements. On the other hand, users of low-phosphoric iron and hematite appear to be somewhat busier and a better demand has recently been forthcoming. In order to induce further orders for low-phosphoric iron, some producers have reduced their prices and current quotations range from about £5 15s. to £5 17s. 6d. per ton. These are the lowest figures obtainable and many producers continue to adhere to a minimum of £6 2s. 6d. The Association price for refined pig-iron is £8 5s., but several firms outside the Association are quoting lower prices.

SCOTLAND.—A few small orders are all that is being received in this district, consumers being in possession of adequate stocks. In addition, there are large tonnages stored at the docks at Grangemouth. No further shipments are being received. Consumption of hematite and basic at the steelworks is well maintained. No difficulty is experienced in obtaining full requirements. Prices are unchanged, as follow :—No. 3 foundry, 118s. f.o.t. furnaces (123s. f.o.b. Glasgow); No. 1 foundry, 120s. 6d.; hematite mixed numbers, 133s.; Scottish basic, 107s. 6d.; English and Indian basic, 100s., all less 5s. per ton rebate, delivered.

Coke

Prices are unchanged on the foundry-coke market. Little new business is being transacted and, while there is no necessity to take up additional tonnages, consumers will remain out of the market in the hope that producers will reduce quotations during the summer months. For their part, coke makers adhere to their statement that prices will remain fixed until the end of the year.

Steel

Quiet conditions have ruled in the steel market since the Easter holidays, but recently there has been some indication of a revival in the volume of inquiry, says the official report of the London Iron and Steel Exchange. The semi-finished steel department is in a congested condition, and for the time being practically no new business is being undertaken. Some time must elapse before the consuming industries can absorb the quantities available, and in the meantime, new production is likely to be restricted. Output at the heavy steel works continues at a high rate, and many of the makers have arrears of orders still to finish up. Although contracts are being completed much more quickly than new business is coming to hand, this branch of the industry would appear to be in a position to maintain a full rate of operations for some months to come. Some of the lighter sections of the industry, however, are not so well placed as regards orders. Rather brighter conditions have developed in a few export markets, but for the most part overseas buyers continue to maintain a cautious attitude.

Scrap

If no agreement existed with regard to the stabilisation of steel scrap prices, no doubt there would have been reductions already. Steelworks are taking up fairly heavy tonnages, but the available supply is considerably in excess of the current demand. The reduced activity at the tinplate and sheet mills has made consumption of scrap much lower than it would otherwise have been. Until consumers have worked off their stocks there will be little new business.

Metals

Copper.—Following a firmer tone in the market before the week-end, this metal has again received little support. The conclusion of the Anglo-Italian agreement tended to increase consumers' confidence, while more settled news from the United States also helped to bring about an improvement, but the past few days have witnessed something of a recession. Although a Bill has been introduced in the House of Representatives to repeal the import duty of 4 cents per lb. on copper, it is reported from Washington that there is little likelihood of the measure being passed. New York reports state that Mr. C. F. Kelley, president of the Anaconda Copper Mining Company, and Mr. C. T. Ulrich, vice-president of the Kennecott Copper Corporation, have sailed for Europe. Both concerns are Chilean producers and members of the International Copper Cartel.

Metal Exchange quotations were as follow :—

Cash.—Thursday, £39 11s. 3d. to £39 12s. 6d.; Friday, £39 11s. 3d. to £39 13s. 9d.; Monday, £39 8s. 9d. to £39 11s. 3d.; Tuesday, £39 10s. to £39 11s. 3d.; Wednesday, £39 13s. 9d. to £39 16s. 3d.

Three Months.—Thursday, £39 16s. 3d. to £39 17s. 6d. ; Friday, £39 17s. 6d. to £39 18s. 9d.; Monday, £39 13s. 9d. to £39 16s. 3d.; Tuesday, £39 15s. to £39 16s. 3d.; Wednesday, £40 to £40 1s. 3d.

Tin.—Business in this market has been quiet during the past week. Tinplate makers, both at home and abroad, have experienced very unsatisfactory trade for a considerable time past, but it is hoped that the recent decrease in prices of tinplates will shortly have a stimulating effect on this section.

It is understood that there is no possibility of a referendum being taken among Malayan tin producers in respect of the proposed buffer pool. It is reported from Singapore that a recommendation has been made to Mr. Ormsby-Gore, Secretary of State for the Colonies, that a revision of standard tonnages, on the basis of the capacity of production of the signatory countries, be made forthwith. The recommendation, it is believed, is to be made before the minority report of the Malayan Chamber of Mines has reached the local government. The question of a pool has not been dropped altogether, and it is likely that when tonnages are revised, the question will be raised again, though the pool would be of an entirely different character from that now suggested. Should the world's visible stocks continue to rise and prices to remain at an uneconomic level, Malayan tin interests would support a proposal to buy up and segregate the existing stocks, which would be controlled by an entirely different form of administration from that proposed under the present scheme. Despite conflicting reports London tin circles still believe that a buffer pool will eventually be formed.

Efforts to induce the Government to guarantee a minimum price for Cornish tin have so far failed. Submissions to the Minister for the Co-ordination of Defence on the grounds that increased home production of tin was desirable as a precaution against possible difficulties of obtaining supplies in case of war have met with a refusal. Nevertheless, Cornish M.P.s will meet shortly to consider what other steps shall be taken with a view to obtaining Government assistance. Cornwall has produced 2,000 tons of tin annually during the past four years. This production, it is contended, could be doubled.

It is understood that the reduction in the price of tin has led to a modification of the proposal to merge the Banka Tin Mines with the Billiton Company.

Official quotations were as follow :—

Cash.—Thursday, £168 15s. to £169; Friday, £167 15s. to £168; Monday, £167 12s. 6d. to £167 15s.; Tuesday, £165 to £165 10s.; Wednesday, £164 10s. to £165.

Three Months.—Thursday, £169 5s. to £169 10s.; Friday, £168 10s. to £168 15s.; Monday, £168 5s. to £168 10s.; Tuesday, £166 to £166 5s.; Wednesday, £165 5s. to £165 10s.

Spelter.—There has been no expansion of business in this market, which remains dull. Buyers continue to adopt a cautious attitude when it comes to taking up additional tonnages and trade is generally of a hand-to-mouth nature. There has recently been a period of heavy buying in the United States, but the last few days have seen a recession. According to the Metallgesellschaft, the world's zinc smelter output in February amounted to 128,959 metric tons, as compared with 142,850 tons in the previous month.

Daily market prices :—

Ordinary.—Thursday, £13 16s. 3d.; Friday, £13 17s. 6d.; Monday, £13 15s.; Tuesday, £13 10s.; Wednesday, £13 11s. 3d.

Lead.—There has been little activity in this market of late and the Easter holiday has added further to the dullness. Another fall in the estimated cost of building plans approved in March is revealed in the Ministry of Labour returns for 142 local authorities. The total in March was £8,489,500, which is a decline of £1,197,600, or 12.4 per cent., as compared with the corresponding month of last year.

Day-to-day quotations :—

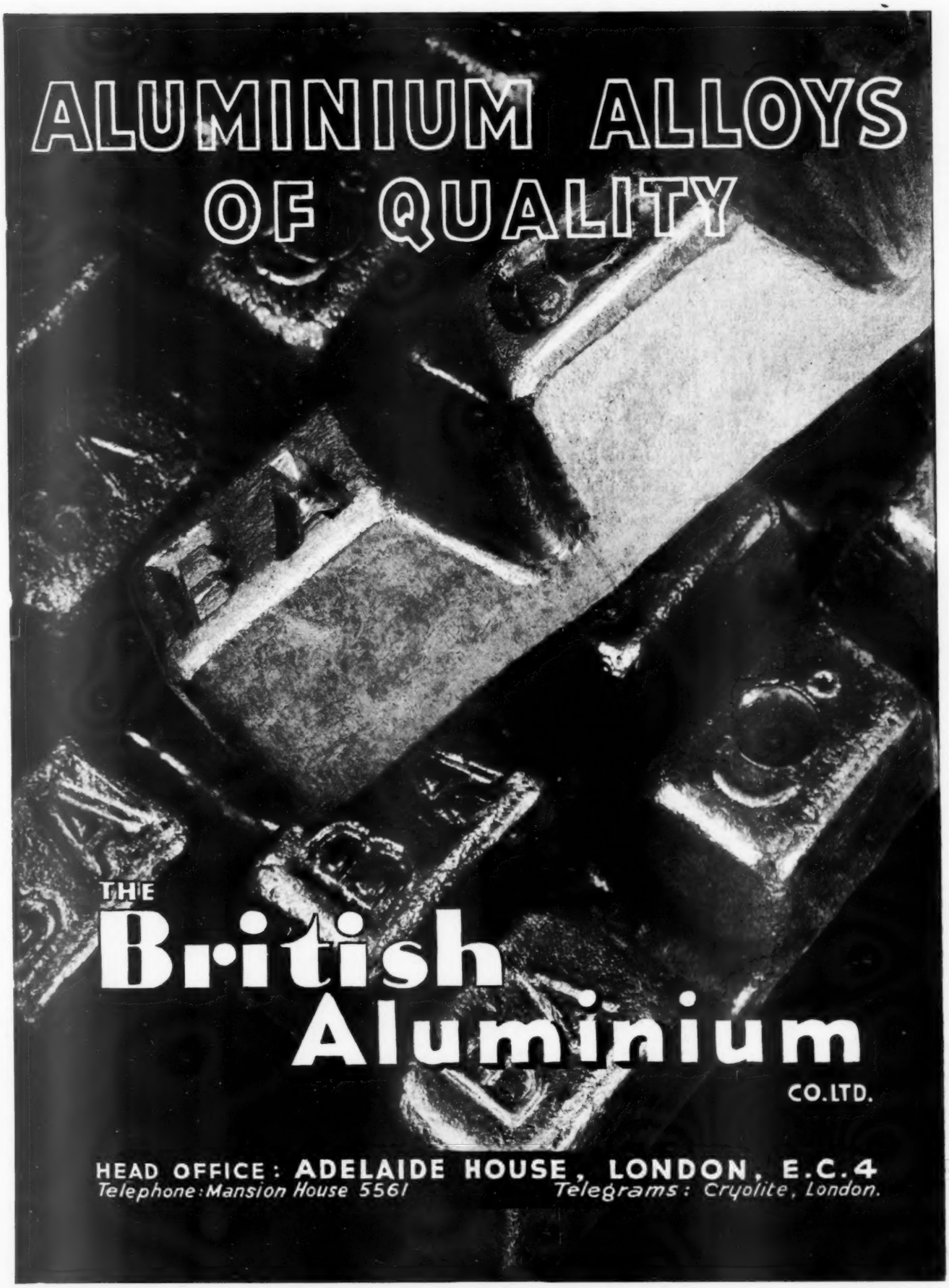
Soft Foreign (Prompt).—Thursday, £15 11s. 3d.; Friday, £15 10s.; Monday, £15 5s.; Tuesday, £15 1s. 3d.; Wednesday, £15.

Scrap.—Only a small amount of business has been transacted since the holidays, but the outlook is now viewed more favourably. It is anticipated that there will shortly be an expansion of buying and that prices will rise accordingly.

Approximate selling prices for old metal:—New aluminium cuttings, £77; rolled, £64; cast, £34; foil, £88. Copper, £36 to £39; braziery, £34. Brass (clean), £22 to £25. Zinc, £7 10s. Lead, £12. Gunmetal, £38 to £39.

Duty on Eireann Zinc

The following is extracted from a letter sent to Mr. Chamberlain by Mr. de Valera and published with the text of the Anglo-Eireann Trade Agreement:—The Government of Eire, having taken note of the statements of the United Kingdom Government (1) that it is essential to the national security that the production of the zinc smelting industry in the United Kingdom should be maintained at a satisfactory level; and (2) that the Government of the United Kingdom would consult the Government of Eire before taking any decision to impose a Customs duty on imports of zinc from Eire into the United Kingdom; agree that it will be open to the U.K. Government, after consultation with the Government of Eire, and notwithstanding the provisions of Article I of the Trade Agreement, to impose a Customs duty on imports of zinc produced or manufactured in Eire. It is understood that no Customs duty will be imposed on zinc from Eire which is not equally applicable to zinc from any country within the British Commonwealth of Nations.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RAW MATERIALS—PRICE LIST

(Wednesday, April 27, 1938)

COPPER

	£	s.	d.
Standard cash	39	13	9
Three months	40	0	0
Electrolytic	43	10	0
Tough	42	15	0
Best selected	43	5	0
Sheets	75	0	0
India	55	17	6
Wire bars	44	10	0
Ingot bars	44	10	0
H.C. Wire rods	48	0	0
Off. av. cash, Mar.	39	16	4 29/46
Do., 3 mths., Mar.	40	0	11 19/46
Do., Sttlmnt., Mar.	39	16	7 23/23
Do., Electro, Mar.	44	0	1 7/23
Do., B.S., Mar.	43	18	7 1/2
Do., Wire bars, Mar.	44	8	7 1/23
Solid drawn tubes			12½d.
Brazed tubes			12½d.
Wire			8d.

BRASS

Solid drawn tubes	11d.
Brazed tubes	13d.
Rods, drawn	9d.
Rods, extd. or rlld.	6½d.
Sheets to 10 w.g.	8¾d.
Wire	8½d.
Rolled metal	7½d.
Yellow metal rods	6½d.

TIN

	£	s.	d.
Standard cash	164	10	0
Three months	165	5	0
English	164	10	0
Bars	167	0	0
Straits	167	0	0
Eastern	171	10	0
Banca (nom.)			—
Off. av. cash, Mar.	183	11	8 20/46
Do., 3 mths., Mar.	183	12	8 1/23
Do., Sttlmt., Mar.	183	11	1 1/23

SPELTER

	£	s.	d.
Ordinary	13	11	3
Remelted	11	5	0
Hard	10	15	0
Electro, 99.9	17	8	9
English	14	15	0
India	13	10	0
Zinc dust	19	0	0
Zinc ashes	5	5	0
Off. aver., Mar.	14	8	4 85/92
Aver., spot, Mar.	14	7	3 9/23

LEAD

	£	s.	d.
Soft foreign, ppt.	15	0	0
Empire (nom.)	15	17	6
English	17	5	0
Sheets, home	23	15	0
Do. export	19	10	0
Pipes, home	23	5	0
Do. export	20	2	6
Tea lead	31	5	0
Off. aver., Mar.	16	0	7 81/92
Aver., spot, Mar.	15	19	10 1/23

ALUMINIUM

Ingots	£100 to £105
Wire	1/3 to 1/4 lb.
Sheet and foil	1/2 to 1/4 lb.

ZINC SHEETS, &c.

	£	s.	d.	£	s.	d.
Zinc sheets, English	28	5	0 to	28	15	0
Do., V.M. ex-whse.	28	5	0 to	28	15	0
Rods				20	0	0

ANTIMONY

	£	s.	d.	£	s.	d.
English	78	0	0 to	81	0	0
Chinese, ex-whse.				64	0	0
Crude, c.i.f.				37	0	0

QUICKSILVER

	£	s.	d.
Quicksilver	12	5	0

FERRO-ALLOYS AND STEEL-MAKING METALS

	£	s.	d.
Ferro-silicon—			
25%	12	10	0
45/50%	12	0	0
75%	17	0	0
Ferro-vanadium—			
35/50%	14/- lb. Va.		
Ferro-molybdenum—			
70/75% carbon-free	4/9 lb. Mo.		
Ferro-titanium—			
20/25% carbon-free	9d. lb.		
Ferro-phosphorus, 20/25%	£21 to £22		
Ferro-tungsten—			
80/85%	4/8 lb.		
Tungsten metal powder—			
98/99%	4/9½ lb.		
Ferro-chrome—			
2/4% car.	34	10	0
4/6% car.	24	5	0
6/8% car.	24	0	0
8/10% car.	24	0	0
Ferro-chrome—			
Max. 2% car.	36	0	0
Max. 1% car.	38	5	0
Max. 0.5% car.	41	0	0
70% carbon-free	10d. lb.		
Nickel—99.5/100%	£180 to £185		
"F" nickel shot	£165	0	0
Ferro-cobalt, 98/99%	8/6 to 8/9 lb.		
Metallic chromium—			
96/98%	2/5 lb.		
Ferro-manganese—			
76/80% loose	£18 15	0 to 19	5 0
76/80% packed	£19 15	0 to 20	5 0
76/80% export	£22	0	0
Metallic manganese—			
94/96% carbon-free	1/3 lb.		

Per ton unless otherwise stated, basis 2-ton lots.

SCRAP

	£	s.	d.	£	s.	d.
South Wales (West)—						
Heavy steel, best	3	8	9 to	3	11	3
Mixed iron and steel	3	6	9 to	3	9	3
Heavy cast iron	3	8	9 to	3	11	3
Good machinery	3	12	6 to	3	15	0
Cleveland—						
Heavy steel, best	3	7	0 to	3	9	6
Steel turnings	2	13	0 to	2	15	6
Heavy cast iron				4	0	0
Heavy machinery				4	5	0
Midlands—						
Short heavy steel				3	12	6
Light cast-iron scrap				3	2	6
Heavy wrought iron	4	0	0 to	4	5	0
Steel turnings	2	6	3 to	2	8	9
Scotland—						
Heavy steel, best	3	5	0 to	3	7	6
Ordinary cast iron	4	0	0 to	4	2	6
Cast-iron borings	2	0	6 to	2	3	0
Wrot-iron piling	4	5	0 to	4	7	6
Heavy machinery				4	6	6

London—Merchants' buying prices, delivered yard.

	£	s.	d.
Copper (clean)	32	0	0
Brass	20	0	0
Lead (less usual draft)	13	10	0
Tea lead	11	0	0
Zinc	7	0	0
New aluminium cuttings	69	0	0
Braziery copper	29	0	0
Gunmetal	32	0	0
Hollow pewter	120	0	0
Shaped black pewter	83	0	0

HIGH-SPEED TOOL STEEL

Finished bars, 14% tungsten	3s. 0d.
Finished bars, 18% tungsten	3s. 10d.

Per lb. d/d buyers' works.

PIG-IRON*

N.E. Coast (d/d Tees-side area)—	
Foundry No. 1	111/6
„ No. 3	109/-
„ No. 4	108/-
Forge No. 4	108/-
Hematite No. 1	133/-
Hematite M/Nos.	132/6
N.W. Coast—	
Hem. M/Nos. d/d Glas.	133/-
„ d/d Birm.	144/6
Malleable iron d/d Birm.	160/-
Midlands (d/d Birmingham dist.)—	
Staffs No. 4 forge	110/-
„ No. 3 fdry.	111/-
Northants forge	107/6
„ fdry. No. 3	108/6
„ fdry. No. 1	111/6
Derbyshire forge	110/-
„ fdry. No. 3	111/-
„ fdry. No. 1	114/-
Scotland—	
Foundry, No. 1, f.o.t.	120/6
„ No. 3, f.o.t.	118/-
Cleveland No. 3, Glasgow	112/-
„ „ Falkirk	109/-
Scottish hem. M/Nos. d/d	133/-
Sheffield (d/d district)—	
Derby forge	107/6
„ fdry. No. 3	108/6
Lincs forge	107/6
„ fdry. No. 3	108/6
W.C. hematite	138/6
Lancashire (d/d eq. Man.)—	
Derby fdry. No. 3	114/-
Staffs fdry. No. 3	114/-
Northants fdry. No. 3	112/6
Cleveland fdry. No. 3	114/-
Glengarnock, No. 3	140/-
Clyde, No. 3	140/-
Monkland, No. 3	140/-
Eglinton, No. 3	140/-
Gartsherrie, No. 3	140/-
Shotts, No. 3	140/-

(* Prices of hematite and basic pig-iron, and of foundry and forge iron with a phosphoric content of not less than 0.75 per cent., are subject to a rebate of 5s. per ton under certain conditions.)

FINISHED IRON AND STEEL

Usual district deliveries.

[A rebate of 15/- per ton for steel sections, plates and joists is obtainable in the home trade under certain conditions.]

	£	s.	d.	£	s.	d.
Iron—						
Bars (cr.)	13	5	0 to	13	15	0
Nut and bolt iron	11	12	6 to	12	2	6
Hoops				14	2	6
Marked bars (Staffs) f.o.t.				15	15	0
Gas strip				14	2	6
Bolts and nuts, ¾ in. × 4 in.				17	10	0 and up
Steel—						
Plates, ship, etc.	11	8	0 to	11	10	6
Boiler plts.	11	18	0 to	12	0	6
Chequer plts.				13	0	6
Angles				11	0	6
Tees				12	0	6
Joists				11	0	6
Rounds and squares, 3 in. to 5½ in.				12	0	6
Rounds under 3 in. to ¾ in. (untested)				12	4	0
Flats—8 in. wide and over				11	5	6
„ under 8 in. and over 5 in.				11	10	6
Rails, heavy				10	2	6
Fishplates				14	2	6
Hoops (Staffs)				12	19	0
Black sheets, 24g. (4-t. lots)				15	15	0
Galv. cor. shts. („)				18	10	0
Galv. flat shts. („)				19	0	0
Galv. fencing wire, 8g. plain				20	5	0
Billets, soft, 100-ton lots				7	17	6
Sheet bars				7	15	0
Tin bars				7	15	0

PHOSPHOR BRONZE

	Per lb. basis
Strip	10½d.
Sheet to 10 w.g.	11½d.
Wire	12½d.
Rods	13d.
Tubes	18½d.
Castings	15d.

Delivery 3 cwt. free.
10% phos. cop. £33 above B.S.
15% phos. cop. £38 above B.S.
Phosphor tin (5%) £30 above price of English ingots.
C. Clifford & Son, Limited.

NICKEL SILVER, &c.

	Per lb.
Ingots for raising	8d. to 1/2
Rolled—	
To 9 in. wide	1/2 to 1/8
To 12 in. wide	1/2½ to 1/8½
To 15 in. wide	1/2½ to 1/8½
To 18 in. wide	1/3 to 1/9
To 21 in. wide	1/3½ to 1/9½
To 25 in. wide	1/4 to 1/10
Ingots for spoons and forks	8d. to 1/4½
Ingots rolled to spoon size	11d. to 1/7½
Wire round—	
to 10g.	1/5½ to 2/0½

with extras according to gauge.
Special 5ths quality turning rods in straight lengths, 1/4½ upwards.

AMERICAN IRON AND STEEL

At Pittsburgh unless otherwise stated.

	Dols.
No. 2 foundry, Phila.	25.84
No. 2 foundry, Valley	24.00
No. 2 foundry, Birm.	20.38
Basic, Valley	23.50
Malleable, Valley	24.00
Grey forge, Valley	23.50
Ferro-mang. 80%, seaboard	102.50
O.-h. rails, h'y, at mill	42.50
Billets	37.00
Sheet bars	37.00
Wire rods	47.00
	Cents.
Iron bars, Chicago	2.40
Steel bars	2.45
Tank plates	2.25
Beams, etc.	2.25
Skelp, grooved steel	2.10
Steel hoops	2.40
Sheets, black, No. 24	3.15
Sheets, galv., No. 24	3.80
Wire nails	2.75
Plain wire	2.90
Barbed wire, galv.	3.40
Tinplates, 100-lb. box	$5.35

COKE (at ovens)

Welsh foundry	42/6
„ furnace	34/6
Durham foundry	39/6
„ furnace	32/6
Scottish foundry	42/-
„ furnace	35/6 to 37/6

TINPLATES

f.o.b. British Channel ports.

I.C. cokes	20×14 per box	20/3 to 20/9
„	28×20 „	40/6 to 41/6
„	20×10 „	29/1½ to 29/7½
„	18¾×14 „	21/1½ to 21/6
C.W.	20×14 „	18/- to 18/6
„	28×20 „	38/6 to 39/-
„	20×10 „	—
„	18¾×14 „	—

SWEDISH CHARCOAL IRON & STEEL

	£	s.	d.	£	s.	d.
Pig-iron	£11	0	0 to	£12	0	0
Bars-hammered, basis	£20	0	0 to	£22	0	0
Bars and nail-rods, rolled, basis	£19	0	0 to	£20	0	0
Blooms	£18	0	0 to	£19	0	0
Keg steel	£30	0	0 to	£35	0	0
Faggot steel	£19	0	0 to	£24	0	0
Bars and rods dead soft st'l	£14	0	0 to	£16	0	0

All per English ton, f.o.b. Gothenburg
[Subject to an exchange basis of Kr. 19.39 to £1.]

DAILY FLUCTUATIONS

Standard Copper (cash)

			£	s.	d.	
Apr.	21	..	39	11	3 dec.	7/6
,,	22	..	39	11	3 No	change
,,	25	..	39	8	9 dec.	2/6
,,	26	..	39	10	0 inc.	1/3
,,	27	..	39	13	9 ,,	3/9

Electrolytic Copper

			£	s.	d.	
Apr.	21	..	43	10	0 dec.	10/-
,,	22	..	43	10	0 No	change
,,	25	..	43	10	0 ,,	,,
,,	26	..	43	15	0 inc.	5/-
,,	27	..	43	10	0 dec.	5/-

Standard Tin (cash)

			£	s.	d.	
Apr.	21	..	168	15	0 dec.	25/-
,,	22	..	167	15	0 ,,	20/-
,,	25	..	167	12	6 ,,	2/6
,,	26	..	165	0	0 ,,	52/6
,,	27	..	164	10	0 ,,	10/-

Tin (English ingots)

			£	s.	d.	
Apr.	21	..	168	15	0 dec.	25/-
,,	22	..	167	15	0 ,,	20/-
,,	25	..	167	12	6 ,,	2/6
,,	26	..	165	0	0 ,,	52/6
,,	27	..	164	10	0 ,,	10/-

Spelter (ordinary)

			£	s.	d.	
Apr.	21	..	13	16	3 dec.	2/6
,,	22	..	13	17	6 inc.	1/3
,,	25	..	13	15	0 dec.	2/6
,,	26	..	13	10	0 ,,	5/-
,,	27	..	13	11	3 inc.	1/3

Spelter (Electro, 99.9 per cent.)

			£	s.	d.	
Apr.	21	..	17	13	9 dec.	2/6
,,	22	..	17	15	0 inc.	1/3
,,	25	..	17	13	9 dec.	1/3
,,	26	..	17	7	6 ,,	6/3
,,	27	..	17	8	9 inc.	1/3

Lead (soft foreign, prompt)

			£	s.	d.	
Apr.	21	..	15	11	3 dec.	3/9
,,	22	..	15	10	0 ,,	1/3
,,	25	..	15	5	0 ,,	5/-
,,	26	..	15	1	3 ,,	3/9
,,	27	..	15	0	0 ,,	1/3

Lead (English)

			£	s.	d.	
Apr.	21	..	17	15	0 No	change
,,	22	..	17	10	0 dec.	5/-
,,	25	..	17	5	0 ,,	5/-
,,	26	..	17	5	0 No	change
,,	27	..	17	5	0 ,,	,,

AVERAGE MONTHLY PRICES OF MARKED BARS (SOUTH STAFFS).

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly average
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1904	8 10 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 10
1905	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 10 0	8 10 0	8 1 8
1906	8 10 0	9 0 0	9 0 0	9 0 0	9 0 0	9 0 0	9 0 0	8 10 0	8 10 0	8 10 0	8 10 0	9 0 0	8 15 10
1907	9 0 0	9 0 0	9 0 0	9 0 0	9 0 0	9 0 0	9 0 0	9 0 0	9 0 0	9 0 0	9 0 0	9 0 0	9 0 0
1908	9 0 0	8 10 0	8 10 0	8 10 0	8 10 0	8 10 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 5 10
1909	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0
1910	8 0 0	8 0 0	8 0 0	8 0 9	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0
1911	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 6	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0	8 0 0
1912	8 10 0	8 10 0	8 10 0	8 15 0	9 0 0	9 0 0	9 0 0	9 8 0	9 10 0	9 10 0	9 10 0	9 15 0	9 1 6
1913	10 0 0	10 0 0	10 0 0	10 0 0	10 0 0	10 0 0	10 0 0	9 10 0	9 10 0	9 4 0	9 0 0	9 0 0	9 13 8
1914	8 12 0	8 10 0	8 10 0	8 10 0	8 10 0	8 10 0	8 10 0	9 0 0	9 0 0	9 0 0	9 0 0	9 0 0	8 14 4
1915	9 0 0	9 0 0	9 3 0	10 2 0	10 15 0	11 10 0	12 0 0	12 0 0	12 0 0	12 7 6	12 10 0	13 10 0	11 5 0
1916	13 10 0	13 10 0	14 13 0	15 0 0	15 0 0	15 0 0	15 0 0	15 10 0	15 10 0	15 0 0	15 10 0	15 0 0	14 18 7
1917	15 10 0	15 10 0	15 10 0	15 10 0	15 10 0	15 10 0	15 10 0	15 10 0	15 10 0	15 10 0	15 10 0	15 10 0	15 10 0
1918	15 12 6	16 0 0	16 0 0	16 0 0	16 0 0	16 0 0	16 0 0	16 0 0	16 0 0	17 0 0	17 0 0	17 0 0	16 6 3
1919	18 0 0	18 10 0	20 0 0	20 0 0	23 0 0	23 0 0	23 0 0	24 12 0	25 0 0	25 0 0	25 0 0	25 5 0	22 10 7
1920	26 17 6	27 0 0	28 0 0	30 5 0	30 10 0	33 10 0	33 10 0	33 10 0	33 10 0	33 10 0	33 10 0	33 10 0	31 10 2
1921	31 10 0	30 3 4	27 10 0	27 10 0	27 10 0	24 15 0	21 0 0	20 0 0	20 0 0	17 10 0	17 0 0	16 0 0	23 7 4
1922	16 0 0	14 17 6	14 10 0	13 10 0	13 10 0	13 10 0	13 10 0	13 10 0	13 10 0	13 10 0	13 10 0	13 10 0	13 18 1½
1923	13 10 0	13 10 0	13 16 0	14 7 6	14 10 0	14 10 0	14 10 0	14 10 0	14 10 0	14 10 0	14 10 0	14 10 0	14 5 3½
1924	14 10 0	14 10 0	14 10 0	15 0 0	15 0 0	15 0 0	15 0 0	15 0 0	15 0 0	15 0 0	15 0 0	14 17 6	14 17 3½
1925	15 0 0	15 0 0	15 0 0	15 0 0	15 0 0	14 10 0	14 10 0	14 10 0	14 10 0	14 10 0	14 10 0	14 0 0	14 13 4
1926	14 0 0	14 0 0	14 0 0	14 0 0	14 0 0	14 0 0	14 0 0	14 0 0	14 0 0	14 0 0	*	14 10 0	14 0 10
1927	14 10 0	14 10 0	14 10 0	14 10 0	14 10 0	13 10 0	13 10 0	13 10 0	13 10 0	13 0 0	13 0 0	12 18 0	13 15 8
1928	12 10 0	12 10 0	12 10 0	12 2 6	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 2 9½
1929	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 7 6	12 10 0	12 10 0	12 2 3½
1930	12 10 0	12 10 0	12 10 0	12 10 0	12 10 0	12 10 0	12 10 0	12 10 0	12 10 0	12 10 0	12 10 0	12 10 0	12 13 0
1931	12 10 0	12 10 0	12 10 0	12 8 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 3 2
1932	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0
1933	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0
1934	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0
1935	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0
1936	12 0 0	12 2 6	12 10 0	12 10 0	12 10 0	12 10 0	12 10 0	12 15 0	13 0 0	13 0 0	13 0 0	13 0 0	12 12 3½
1937	13 0 0	13 0 0	14 0 7½	14 7 6	14 7 6	14 7 6	15 1 3	15 15 0	15 15 0	15 15 0	15 15 0	15 15 0	14 14 11½
1938	15 15 0	15 15 0	15 15 0	—	—	—	—	—	—	—	—	—	—

* No quotation available.

WILLIAM JACKS & COMPANY,

WINCHESTER HOUSE, OLD BROAD ST., LONDON, E.C.2.

CLARENCE CHAMBERS, 39, CORPORATION STREET, BIRMINGHAM.

13, RUMFORD STREET, LIVERPOOL.

PIG IRON

REGISTERED TRADE MARK

FOR EVERY TYPE OF CASTING

NON-FERROUS METALS

REFRACTORIES — COKE — SAND

FERRO-SILICON—FERRO-CHROME—NICKEL-CHROME

WILLIAM JACKS & COMPANY,

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ZETLAND ROAD, MIDDLESBROUGH.

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(A remittance should accompany instructions.)

SITUATIONS VACANT AND WANTED

FITTER requires position in Lancashire area or South England, either as Fitter or Foreman. First-class range and stove experience; knowledge foundry practice. Technical training.—Box 910, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

FOUNDRY MANAGER desires change. At present engaged in foundry taking in all types of general engineering castings; mechanised plant, iron and non-ferrous, pattern-shop. Fully capable of taking entire charge and guarantee results. Age 40. Go anywhere.—Box 898, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

FOUNDRY FOREMAN seeks change. Fifteen years practical moulder, good class shops; technical, metallurgy. Guaranteed to get results. Machinery and jobbing work. Good references supplied; three years present position.—Box 908, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

FOREMAN with experience in machine moulding wanted for grey-iron foundry making small castings for the electrical industry. State age, full qualifications and experience, salary required, and when free to: PERSONNEL DEPT. (F.T.J.), THE BRITISH THOMSON-HOUSTON CO., LTD., Rugby.

GENERAL MANAGER wanted immediately for Malleable Foundry (Whiteheart), capacity 30 tons finished castings per week. First-class executive and organising ability essential with capacity to take complete control of production and supervise other departments. Sound technical and practical knowledge of malleable practice essential and must be good plant engineer. Write, giving fullest details of experience and positions held, together with age and salary required (all applications will be treated in strict confidence).—Box 577, BENNETT WILLIAMS (ADVERTISING), LTD., Piccadilly, Bradford.

WANTED.—Competent man to take charge of steel foundry fettling shop (Siemens). Must be capable of handling men. Give details of previous experience, state age, and salary expected.—Apply Box 904, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

WANTED.—Welder as Charge-hand in steel foundry. Experience in casting work preferred. State age, experience, and wage expected.—Apply Box 906, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

AGENCIES

AGENT wanted by a large foundry for Repetition Grey-iron Castings; preferably with connections.—Box 902, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

FIRST-CLASS AGENTS required calling on iron foundries London, Home Counties and Midlands. Full particulars to: Box 900, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

AGENCIES—*Continued*

ACTIVE AGENT with first-class connection, constantly covering London and 50 miles radius, seeks additional line, preferably Small Repetition Grey Iron or Brass Castings. Results absolutely guaranteed. Only well-established firms able to cope with substantial quantities entertained.—Box 856, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

AGENCY wanted for good class iron castings by London representative with excellent connection of 14 years' standing. Good business can be introduced to foundry able to give good deliveries, and quality.—Reply to: Box 890, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

PUBLICATION

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